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FRANCIS GALTON, Esq., F.R.S., *President, in the Chair.*

The Minutes of the last meeting were read and signed.

The following presents received since the last meeting were announced, and thanks voted to the respective donors:—

FOR THE LIBRARY.

From the AUTHOR.—Études ethnographiques et archéologiques sur l'Exposition Coloniale et Indienne de Londres. Par le Dr. E. T. Hamy.

—— Una gita fra i Calabro-Albanesi. Di Giulio Barroil.

From the PUBLISHERS.—Ratones y Orugas: origen y extinción de las especies. Por Enrique Heriz.

From Dr. GUGLIELMO KITCHMAN.—L'Ateneo:—periodico letterario, scientifico, scolastico, mensuale organo dell'Istituto Galileo-Galilei. Anno xii, Fas. 1 e 2.

From the ACADEMY.—Actas de la Academia Nacional de Ciencias de la República Argentina en Córdoba. Tom. v, Ent. 3.

From the ESSEX FIELD CLUB.—The Essex Naturalist. 1887. No. 11.

From the INSTITUTION.—Journal of the Royal United Service Institution. No. 141.
—— A Brief History of the Royal United Service Institution. By Capt. Boughey Burgess.
From Prof. ALEXANDER AGASSIZ.—Annual Report of the Curator of the Museum of Comparative Zoology at Harvard College, for 1886–87.
From the UNIVERSITY.—The Journal of the College of Science, Imperial University, Japan. Vol. i. Part 4.
From the ROYAL SCOTTISH GEOGRAPHICAL SOCIETY.—The Scottish Geographical Magazine. Vol. iii. No. 19.
From the SOCIETY.—Journal of the Society of Arts. Nos. 1827–1829.
—— Proceedings of the Royal Geographical Society. 1887. December.
—— Proceedings of the Society of Biblical Archæology. Vol. x. No. 1.
—— Journal of the Asiatic Society of Japan. Nos. 275–277.
—— Proceedings of the Asiatic Society of Japan. 1887. Nos. 6, 7, 8.
—— Mittheilungen des Vereins für Erdkunde zu Leipzig. 1886. Heft. 1–3.
From the EDITOR.—Nature. Nos. 943–945.
—— Science. Nos. 250, 251.
—— Revue d'Ethnographie. 1887. No. 3.
—— L'Homme. 1887. No. 21.
—— Bulletino di Paletnologia Italiana. 1887. N. 9 e 10.
—— Photographic Times. Nos. 322, 323.

The following paper was read by the Secretary :—

The MAORI *and the* MOA.

By EDWARD TREGEAR, F.R.G.S.

THERE has been considerable discussion among scientific men for some years on the question as to the knowledge possessed by the Maori in regard to the gigantic extinct bird of New Zealand, called the Moa (*Dinornis*). There is a general tradition current in the South Seas that the fair Polynesians (or Maori) were immigrants, arriving at the different groups of islands in canoes; the New Zealand Maoris having particularly clear remembrances of this event, so far as the statements in ancient legend and tradition can be relied on. If we accept these legends (confirmed by other evidence) as having a basis of fact, two interesting branches of enquiry present themselves.

One is ethnological; if the Moa became extinct many centuries ago, yet was seen by the Maoris, some clue may be gained as to the time this race of men has been in New Zealand. The other is of interest to students of natural history; if the time of the arrival of the Maoris could be fixed, and it could be proved that they had seen the living bird, we might then be able to ascertain how long ago it is since this unique creature was exterminated.

Those who take interest in the subject, range themselves in two parties; one affirming that the Maori not only knew of, but hunted and ate the Moa; the other side asserting that the present inhabitants of the island are the descendants of men who were perfectly ignorant of the habits, use, or even existence of a huge struthious bird. I will endeavour to state in the most concise and impartial manner, what evidence, direct and indirect, has been brought forward to substantiate these opinions.

The direct evidence is that of geology. The bones of the Moa were first found in river beds and fluviatile deposits. These bones may have occurred in strata either ancient or recent, but the identical formation has not yet been decided. Mr. Colenso, Mr. Mantell, Mr. Taylor, and others are agreed in pronouncing that the bones have also been found in vast quantities near the surface of the ground, sometimes a whole plain being dotted with the small mounds formed by the bones. In the Southern Island Moa skeletons have been discovered without any superincumbent material whatever; although in a few years after the arrival of the Europeans the bone deposits had disappeared, having been destroyed by the numerous fern fires, &c. But the remains of the Moa have been excavated by the late Sir Julius Von Haast, Dr. Hector, and other geologists from native ovens buried many feet deep in soil accumulated over them apparently in the course of centuries. These bones so found have traces of gnawing and the marks of fire, and are mixed with the remains of dogs and other animals cooked at the same time. This would seem to denote that geologically the evidence preponderates greatly in favour of the opinion that the Maoris had seen and eaten the Moa, especially as stone weapons similar to those formerly used by the Polynesians are found near the Moa bones. It would seem improbable that such unresting wanderers as the Maoris, men who explored and named the most inaccessible parts of the North Island, who had thinly peopled the South Island, and who certainly visited it to get the greenstone (jade) for their ornaments and weapons, should have omitted to notice this huge bird, of great importance to a people with whom meat was a luxury, and con-

sidering that the Moa skeletons were on the surface of the ground in our own day. The party who take the negative side of the question answer, that although it is almost certain that the Moa has been hunted and eaten by man, there is nothing to show that the hunters were of the fair Polynesian race. Tradition speaks of a people exterminated or driven into the interior of the country by the Maori; it is commonly supposed to have been a Papuan or Melanesian tribe of men, probably using stone weapons similar to those of the Polynesians. Even in these weapons there is somewhat of difference, for in some of the old deposits (notably in the kitchen-middens, containing Moa bones, at the mouth of the Otakai Creek, Otago), are found rude *chipped* fragments of tools, axes, &c., left unfinished, these having been struck from flint, chert, quartz, &c., remnants left by a people using palæolithic weapons ruder than the polished stone weapons, &c., of the Maori.[1]

The indirect evidence is that which is given by the traditions, songs, proverbs, &c., of the Maori people, and by the etymology of words, whether used simply or as compounds, names of places, or of persons. Mr. Colenso, F.R.S., in his articles on the Moa (Vol. xii, "Transactions New Zealand Institute," 1879,) has collected almost all the facts to be ascertained in New Zealand in this indirect manner. Those who can find interest in the subject will do well to turn to the book (to be found in most large English libraries), and read the full result of Mr. Colenso's researches set forth in his own scholarly words. As a brief summary of his work, I offer the following *précis*. The affirmative:—There were well known (although vague) notions current among the older Maoris concerning the former existence of a gigantic bird. Although some of these accounts were mere marvels, some stating that the creature had the face of a man, that it "lived on air," that the last living specimen dwelt on a mountain peak guarded by two great lizards (*Tuatara*), yet they identified the bones shown to them as being true Moa bones. References to the Moa in legend, song, and proverb, (though rare) may be found (I will refer to these in detail further on), and the Maoris vouched for the possession of a Moa feather used for decorating the hair of dead chiefs at their obsequies, and regarded as a precious relic. The negative:—Although every bird, animal, &c., to be found in New Zealand is mentioned in the old legends again and again, its quality as food spoken of, its habits described, its uses for ornamentation, &c.,

[1] It is recorded in legend that when the "Rangi-ua-mutu" (one of the canoes which brought the ancestors of the Maoris to New Zealand), arrived at Rangatapu, the immigrants noticed the flint-flakes (knives) and Moa bones there; apparently as if unaccustomed to them.

dilated on, only a very few scant allusions can be found as to the great edible bird. So also in regard to the hunting scenes, the combat of demi-god and monster, while many legends narrate conflicts with great lizards, water-creatures, &c., there are no stories concerning the chase or capture of the huge feathered biped. While the tale-teller often speaks of the numerous pets and tame animals the Maoris delighted to have near them (some monstrous pets, such as the whale of Tinirau and the saurian of Tangaroamihi), the Moa is never spoken of as being the playmate or property of any hero or deity.[1] The so-called Moa feather as described by the Maoris (and not forthcoming) is represented as being ocellated and of beautiful colours, *like a peacock's feather*, while the feathers, which are almost certainly Moa's feathers, found by the Europeans with the Moa's eggs, are hairy feathers of a dull grey colour resembling somewhat those of the emu. The feather, according to the Maoris' own statement, had been found by them either blown on the wind, or else (by another account) stuck fast in a white-pine tree; there is therefore no ground except mere guessing to associate this feather and the Moa. The Maoris who had beautiful cloaks of albatross and kiwi (*Apteryx*) feathers, heirlooms of many generations, had no cloaks of Moa feathers. They had many weapons of various materials, clubs made of stone, hard wood, the ribs of the whale, &c., but none from the huge leg bones of the Moa.

Thus far tradition and possessions: the evidence of *names* is as follows:—The word *Moa*, besides indicating (*a*) the bird, means (*b*) a drill for boring hard stone; (*c*) a raised plot or bed in a cultivation; (*d*) a coarse-growing or a sea-side grass; (*e*) a certain kind of stone or layer of stone. In composition the word occurs sometimes in names of places; *Te kaki o te moa* = the neck of the Moa; *Moawhiti* = startled Moa, &c. As names of things, such as *raumoa* = Moa's feather, a kind of grass; *taramoa* = the bramble: *maimoa* = a decoy bird.

The old chiefs with whom Mr. Colenso conferred, state that the only information they possess is "anciently the land was burnt up by the fire of Tamatea; then it was that the big living things together with the Moas were all burnt." This Tamatea was a very ancient mythical hero, the fifth lineal descendant from Rangi, the sky. Other old chiefs write thus: "No man of old ever saw the Moa; the last of men, perhaps, who ever saw the Moa was in the time of Noah; because it was at the time of the overturning in the days of Mataoho[2] that

[1] See, however, Sir Walter Buller's note, p. 304.
[2] The time of the New Zealand Deluge.

the race of Moas died whose bones are now seen. . . . . Those men of olden time, as I have said, never saw the Moa—that is, its body, its size, its length, its height, its feathers, never once. No man ever heard of the taste of its flesh, and of its appearance; or of its fat, or its skin, or its being sweet or bitter to the taste. For if, indeed, those men of old had known anything of the Moa they would have left that knowledge to be talked of and handed down to the men of after times. But inasmuch as those men of the olden time did not know, therefore it is most certain that these men who came after them did not know also."

In 1868, Mr. Colenso ("Transactions New Zealand Institute," Vol. i), stated that he did not believe that any Maori had ever seen a Moa, but after having gathered and compared more evidence, he gives the result as in the paper of 1879, from which I have been quoting, and then utters his judgment that the Moa *was* known to the Maori, but very far back in pre-historic times. As to the immense value of the facts as arranged by Mr. Colenso there can be no question, but upon the evidence thus placed before us, the reader will probably form his own judgment. My own opinion leans greatly to the negative; I cannot understand the omission of mention of the great bird in myths, hero combats, hunting scenes, lists of food at feasts, charms and incantations, descriptions of dress, ornaments (as plumes), weapons, pet animals, &c. This weighty silence coupled with the distinct denial of the chiefs that they or their fathers ever saw the Moa since the deluge, overweighs the doubtful evidence to be drawn from use of the word in compounds or the few references to some creature called "Moa" in the traditions or proverbs. But I must add in fairness that any judicial opinion offered by Mr. Colenso regarding New Zealand and its inhabitants is entitled to more respectful consideration than those of a hundred ordinary students of the question.

This then is, so far as I can learn, the position of the argument when last discussed, and to which I cannot see much probability of anything being added in New Zealand by fresh evidence in geology, tradition, or etymology. I believe, however, that we can get additional help in considering the question by studying the sister dialects of the Maori language; and I will take three of the most important as my field of study; the Samoan (Navigator Islands), the Hawaiian (Sandwich Islands), the Tahitian (Society Islands). In these three dialects, as in almost all those spoken throughout Polynesia, Moa is the name of the domestic fowl, the cock and hen of our farmyards. These birds were in the possession of the inhabitants of many of the South Sea Islands when first discovered by Europeans, but were

unknown in New Zealand. In Hawaiian, Moa means, besides the common fowl, (*a*) the name of a stick used in play; (*b*) the name of a plant, the leaves of which, made into a tea, are cathartic; (*c*) the name of a piece of wood made to slide down hill on; (*d*) the name of a moss-like plant growing in the forests; (*e*) a kind of banana or plantain. Also Moa means "cooked," but this is a word which compares with the Maori *maoa*, "cooked," and the vowel value is doubtful. If we consider the compounds in Hawaiian they almost all refer to the bird.

Moaoua, a young cock before his spurs are grown; *moakakala*, a cock with sharp spurs (*kakala* = the Maori *tatara*, from *tara*, a spear-point, spine, thorn); *moakinana*, a hen that has laid eggs; *moamahi*, a cock that conquers, a conqueror; *moamoa*, to be or act the cock among fowls; *hoo-moamoa* (causative), to go in company with, as a cock goes with hens to give warning in case of danger, to be intimate with; *moamoa*, the sharp point at the stern of a canoe. These words all refer to the domestic fowl except the last, which is almost certainly a reference to the spur of a cock. Turning to Samoan, we find that Moa means (*a*) the domestic fowl; (*b*) the end of a bunch of bananas; (*c*) the fleshy part of the *alili* (a mollusc); (*d*) a child's top; (*e*) the epigastric region; (*f*) the middle, as of a road or river.

The compounds are *moa'aivao*, a wild fowl, and *fa'amoataulia*, to provoke a quarrel of two, as of two cocks. In Tahitian Moa means (*a*) the domestic fowl; (*b*) the name of a species of fern; (*c*) a whirligig made of the *amare* seed; (*d*) a bunch of *miro* leaves used in the *marae* (place of assembly). These share with the simple meanings of the Maori, Hawaiian, and Samoan words in giving no help to any description of the bird, or the reason for its being so called.

The compounds in Tahitian are *moafaatito*, a fighting cock; *moahururau*, a fowl of many qualities (fig., an unsteady or fickle person); *moaopapa*, a fowl without a tail; *moafiri*, a wild fowl; *moapateatoto*, a courageous cock, a bold warrior; *moaparuhi*, a cowardly cock, a cowardly warrior; *moataratua*, a cock with a long spur, a bold warrior; *moaraupia*, a peculiarly coloured fowl; *moataavae*, a fowl tied by the leg; *moatautina*, a fowl that beats all his opponents; *moavari*, a cock; *tataramoa*, a prickly shrub.

I think that it is drawing no unfair inference from the consideration of these words if we allow that the creature described in these compound words is distinctly the domestic fowl, the fighting cock, the widely-spread emblem of courage. Cock-fighting, a popular pastime among many ancient peoples, was

a favourite sport of the Polynesians. This accounts for so many words alluding to the cock being compounds of Moa, and for the compounds of Moa not apparently alluding to anything else but the habits, &c., of the cock. If this be the case, it is highly probable that since in Hawaiian, Tahitian, and Samoan the compounds of Moa refer to the domestic fowl, *they also thus refer in New Zealand with the Maori compounds of Moa,* always reserving that there is nothing in the Maori word proving that it is inapplicable to the *Gallinaceæ;* and if in the traditional allusions, proverbial sayings, &c., no evidence can be found which shows that the word was used to denote a huge struthious bird. To pursue the investigation thoroughly, I must refer (this time in detail) to the allusions in myth and proverb. The only ancient legend in which the Moa is mentioned is that (*loc. cit.*), in the story of Ngahue. Mr. Colenso quoted the two or three lines in which the reference appears, but I consider that the quality of the evidence depends much upon the *bona fides* of the narrator, and as to the tale itself bearing the stamp of romance or of reality. So as the myth is very short, I will quote in full as it appears in Sir George Grey's "Polynesian Mythology":—

"*The Legend of Poutini and Whaiapu.*

"Now pay attention to the cause of the contention which arose between Poutini and Whaiapu, which led them to emigrate to New Zealand. For a long time they both rested in the same place, and Hine-tu-a-hoanga, to whom the stone Whaiapu[1] belonged, became excessively enraged with Ngahue and with his stone Poutini.[2] At last she drove Ngahue out, and forced him to leave the place, and Ngahue departed and went to a strange land, taking his jade stone. When Hine-tu-a-hoanga saw that he was departing with his precious stone, she followed after them, and Ngahue arrived at Tuhua with his stone, and Hine-tu-a-hoanga arrived and landed there at the same time with him, and began to drive him away again. Then Ngahue went to seek a place where his jade stones might remain in peace, and he found in the sea this island Aotearoa (the northern island of New Zealand), and he thought he would land there.

"Then he thought again, lest he and his enemy should be too close together, and should quarrel again, that it would be better for him to go further off with his jade stone, a very long way off. So he carried it off with him, and they coasted along, and at length arrived at Arahura (on the west coast of the middle

[1] Or green stone, or jade.
[2] Obsidian, with which the natives grind down the jade.

island), and he made that an everlasting resting place for his jade stone. Then he broke off a portion of his jade stone, and took it with him and returned; and as he coasted along he at length reached Wairere (believed to be on the east coast of the northern island), *and slew the Moa there*[1]; and he visited Whangaparoa and Tauranga, and from thence he returned direct to Hawaiki, and reported that he had discovered a new country which produced the Moa and jade stone in abundance. He now manufactured sharp axes from his jade stone; two axes were made from it, Tutauru and Hau-hau-te-rangi. He manufactured some portions of one piece of it into images for neck ornaments, and some portions into ear ornaments; the name of one of these ear ornaments was Kaukau-matua (which was recently in the possession of Te Heuheu, and was only lost in 1846 when he was killed with so many of his tribe by a landslip. The axe Tutauru was only lately lost by Purahokura and his brother Reretai, who were descended from Tama-ihu-roa). When Ngahue, returning, arrived again in Hawaiki, he found them all engaged in war, and when they heard his description of the beauty of this country of Aotea, some of them determined to come here."

If there is any groundwork of truth in this story, it will be with difficulty sifted out from myth. It may be a mystical way of relating that a race using weapons of jade were driven out by another people using arms of obsidian (or edged with obsidian). The place where Ngahue is said to have landed with his greenstone (the west coast of the middle island), where he made "an everlasting resting place" for it, is the natural home of the jade; the place whence the Maoris procured all the material necessary for their weapons and ornaments. Hine-tu-a-hoanga, who expelled him from his country, we luckily know something about from another legend, not in the "Polynesian Mythology." The name means "Young-lady-standing-as-a-whetstone." She was a grand-daughter of the sister of Maui, the great demi-god of Polynesia, and, like Maui, was a magician of high rank. Her brother Rata felled a large tree for a canoe, but omitted to pay the proper respect to the Lord of Forests by offering up prayers and incantations before commencing work. In the night the "multitude of the wood-elves," assembled, and stood the tree upright again. The same thing happened the next day, and the next, till Hine-tu-a-hoanga said to her brother, "You must first rub your axe on my sacred body, as on a whetstone, then you will succeed." He did so, and completed his work.

[1] The words in italics are not in the English translation, but are in the original Maori, "*Ka tae a Ngahue ki te Wairere, ka patua te Moa.*"

On such ground, and with such personages as these, we are in fairy-land. I cannot believe that any reliance can be placed on one or two words to be found in such a tale. Moreover, the Moa spoken of may be anything; there is no description or hint whatever. From the hundreds, nay thousands, of proverbs used by the Maoris the following have been arranged as containing the only references to the Moa which can be found:—

(1.) "The firewood with which the Moa was baked was the *koromiko*" (*Veronica*).

(2.) "*Mihiau* was the name of the stone with which the Moa was cooked."

(3.) "All have been destroyed as completely as the Moa."

(4.) "All have disappeared or perished just as the Moas perished."

(5.) "The Rata was trampled down when young by the Moa."

(6.) "Even as the Moa, feeding upon air."

(7.) "Art thou indeed a Moa that thou dost not eat?"

(8.) "A Moa living upon air."

(9.) "A Moa's stomach, or appetite."

Taking these in sequence, No. 1 tells us nothing of the nature of the food cooked. Nor does No. 2; the meaning of the word *mihiau* is lost, but it is supposed to have been a kind of obsidian. No. 3 may allude to any extinct bird, as may No. 4. No. 5 is based on the idea that the irregular appearance of a huge tree may be caused by trampling on it when it is a small plant: a proverb against evil habits in the young. Nos. 6, 7, 8, 9, are all references to the traditional habit of the Moa standing on a hill-peak "eating the wind," and were used to those who had no appetite for food, "living on air," applied to love-sick persons, &c. There is, however, a doubt as to the *original* meaning of the word here rendered *air* or *wind;* as it is also the name of an ancient charm chanted by sorcerers in order to make a person pine away and die. In none of these proverbs is there any allusion to the nature of the bird, to its gigantic size, or to any peculiar habit, unless it be its "feeding on the wind," which we can hardly refer by analogy to any existing creature, and which is probably either a mistranslation sanctified by long usage, or a pure invention of romance.

The poetical evidence is as follows. In an ancient poem called "The Lament of Turaukawa," these lines occur:—

> "I have indeed heard (from olden times),
> That the *korohiko*[1] (shrub) was by *hikuao*,
> The very tree with which the Moa was roasted
> When all its fat was melted down —"

[1] For Koromiko (*Veronica*).

This is a paraphrase of proverb No. 1, or else the proverb is a condensed quotation from the song. The next is in a dirge for the slain :—

> " Very calm and placid now the raging billows have become,
> Even (as it were) at the total destruction of the Moas
> When the cusps of the new moon dropped off and fell down (to earth)."

This is highly poetical, but it tells us nothing. The next is an entire song :—

> " Alas ! afterwards do thou in the evening hours,
> Produce and begin the talk of old,
> The story of the very earliest times
> Of the great ancient men :
> Thus let it be, begin with the very beginning of all,
> With the chief *Kahungunu;*
> So that the bird's plume here present,
> That is to say, of the Moa,
> Shall be stuck into the hair of my principal chief
> (or beloved one)."

The conclusion of another song runs thus: " Poor betrothed beauty, there thou art alone and forlorn, standing continually in the midst of the dense thicket, even as the Moa feeding on air, thy posts (supports or fences) are only for the long, shaggy, ash-coloured lichen to fly and adhere to, nothing more ! "

These quotations, the only references to be found among the hundreds of Maori poems which have been preserved, give no more clue than do the proverbs to the appearance of the bird. The compound words to be found in Maori, I give from Mr. Colenso's list. As names of places: *Te kaki o te moa* = the neck of the Moa. *Pukumoa* = belly or bowels of the Moa. *Papamoa* = Moa flat; also *Spinifex* flat. *Taramoa* = Moa's spur; also bramble (*Rubus australis*). *Taramoa rahi* = spur of the big Moa. *Hauturu moanui* = *Hauturu-big-Moa ; i.e.*, possessing, or having had there a big Moa. (There are several places called *Hauturu.*) *Moakura* = red or brownish Moa. *Rauhamoa* = said to be the name also of a bird. *Moakatino* = big or fine Moa, or Moas. *Otamoa* = Moa eaten raw. *Haraungamoa* = Moa, or Moas, observed, or watched, or sought ; or the spot where the skin of a Moa was merely grazed, and it got off. *Tarawamoa* = stand, or stage, erected for hanging dead Moa. *Moawhiti* = startled Moa, or doubling Moa. *Moawhangaiti* = Moa briefly waited for ; *Moawhanganui* = Moa long waited for. *Moarahi* = big Moa. *Moawhango* = hoarse-sounding Moa. As names of persons: *Tawakeheimoa*—this may mean *Tawake* able to meet a Moa. (I must condense the other words.) *Te kahureremoa*—this may mean the garment which fell off, or was thrown aside in fleeing from a Moa. In names of things: *raumoa, kauhan-*

gaamoa, *karuamoa* = names of three varieties of New Zealand flax (*Phormium*). *Hinamoa* = a grub in wood, eating and making it rotten, and yet having a fair outside. *Moai* = peaceful, quiet, as the land in a state of peace. *Maimoa* = a decoy bird—as a tame parrot, kept solely for that purpose; to decoy by means of a tame bird or bait. Mr. Colenso remarks on the etymology of this word that *mai* meaning "hither," *maimoa* would be "come hither, Moa"—an admirable name for a decoy. Williams ("New Zealand Dictionary") gives *maimoa* as "a pet, a fondling"—perhaps from the decoy bird being kept as a household pet. If such a huge creature as the *Dinornis* had been kept as a pet wherewith to decoy others of its species (as ducks are used as decoys for ducks, parrots for parrots, even tame elephants for wild ones), all mention of such inhabitants of their villages has been omitted from lists of pets, huntings, songs, and traditions. *Moamoa* and *hamoamoa* = small spherical shining mineral balls, the size of marbles, found in the earth in several places. *Whaka-moa* = to make up, or raise a plat, or heap of small stones, or of earth: to make a raised bed of earth, for planting, as in a food cultivation. *Whaka-maimoa* = to show kindness to rough, undeserving people; to make tame, civil (this from the pet or decoy word).

I have given these words with their probable meanings as suggested by our best scholar; but, he adds, "in almost every case they may mean (or originally have meant) something else; for some of them may have reference to a man, or men, named Moa; others (as *papamoa*, *raumoa*) to the seaside grass called Moa, &c."

The "Moa with a hoarse cry" may allude to any bird which has a loud note; the "red Moa" would seem to be inapplicable to the dull grey bird which (to judge by the few feathers we possess) the Moa probably was; "Moa eaten raw" tells us nothing; but there are two or three of the compound words which are of importance, if my theory that the Maoris once knew the domestic fowl and lost it, is correct. *Taramoa* = "Moa's spur," and *tataramoa* = "the bramble." The New Zealand bramble is a plant of which leaf and branch are covered (underneath) with spines curved backward like the spur of a cock. Similar thorny plants received similar names in the sister dialects; the Tahitian *tataramoa* a prickly shrub, and the Tongan *talatalamoa*, a thorny plant, being apparently equivalent in derivation to the Hawaiian (reversed form) *moakakala* (*i.e.*, *moatatara*), a cock with sharp spurs. A strong inference may be drawn that the persons who thus named thorny plants either were once altogether in a place where such plants had already received this name drawn from the "spur of

the cock," or else that possessing a thorough knowledge of the qualities and fighting weapon of the cock, they had separately dropped upon a common term for thus describing prickly shrubs; of course the presumption is against such coincidence, and in favour of the plant having received its name before the dispersion. But, if so, although the cock was unknown in New Zealand in the days of Cook, it is practically good evidence that the forefathers of the Maori were once acquainted with it. The other important compound is the Maori word *tautauamoa*, defined by Williams in his "New Zealand Dictionary" as "a quarrel in which few take part." This may apply to the *Dinornis* if we could find out enough concerning its habits to show that it was of a combative nature; but beside this word, I set one of identical etymology in Samoan, *fa'amoataulia*, "to provoke a quarrel of two, as if of two cocks"—(Pratt, "Samoan Dictionary"). *Tau*, in Maori, means "to attack," and *taua*, "a war-party." *Tau*, in Samoan, means "to fight," and *taua* "a war-party." The Samoan word dissected stands thus *fa'a*, a causative prefix, "to make" (answering to New Zealand *whaka*), *tau*, to fight, *moa*, a cock, *lia*, verbal termination. Thus the *modern* Maori interpretation, "a quarrel in which few take part," resolves itself into a probable "cock-fight."

I believe these two etymologies to be of great importance. If the Maoris, having lost the domestic fowl, applied to the older men (who had seen or heard of it) for a picture or representation of it, perhaps the image of a crowing cock, with its beak open, would be presented to them, as it is so often among ourselves on signs, trademarks, &c. This may account for the "feeding on the wind" notion; and the connection of the word Moa with the enormous bones, may have arisen in the following way. If the island was inhabited, as some traditions say, by an aboriginal race, the exterminators of the Moa, these autochthones, either as slaves, or before their utter extinction, may have passed on the tradition of the huge lost bird to the Polynesian new-comers. Or, the stories concerning the Moa bird being a large one, may have been but the child of that wonderful spirit of romance and love of the marvellous which, growing with endless repetitions, magnified the lost bird of their forefathers to gigantic dimensions. The lizard-monsters (such as *hotupuku*) destroyed by ancient heroes were like "moving hills"—the water-creatures (such as *pekehaua*) similarly described, were the size of "whales," although we know of no lake-dwelling, or river-dwelling reptiles growing to anything approaching such bulk; antiquity magnified them, as the mists of the Brocken magnify men into enormous spectres. The discoverers of the Moa skeletons state that they (the Europeans)

first informed the Maoris that the bones were the bones of a *bird*. Mr. Colenso states that pictures representing the *Dinornis* as "reconstructed" were shown about, and rewards offered all over the island for the discovery of skeletons of the Moa; that the young natives taught at the Missions dispersed everywhere through the country, and that thus conversations were started in every Maori village concerning the great bird. It is possible that the statement of the Europeans that the bones of a large bird which had once existed were wanted, and the traditional stories of the Moa (domestic fowl) swollen large by time were fitted together and produced strange freaks of memory concerning half-forgotten tales. It can hardly be believed that the Samoans, the Hawaiians, the Tongans, the Tahitians, &c., were acquainted with the *Dinornis*, or named their thorny plants, or their "quarrel of two," from any reminiscence of the huge bird of New Zealand.

In whatever way the question may be settled as to the Maoris connecting the bones of the *Dinornis* with the word Moa, I believe that this paper offers strong reasons for believing that—

1st. The Maoris, like all other Polynesians, once knew the domestic fowl.

2nd. That they knew the domestic cock as Moa.

Discussion.

Sir Walter Buller, who was unable to be present, sent the following note:—At the hearing of an important case in the Native Land Court at Rangitibei, (in 1883), which arose out of a disputed tribal claim to a large block of land, evidence was adduced, in support of the Ngatiapa title by occupation, that the ancestors of the tribe migrated from Taupo to the sea coast in consequence of a quarrel over a pet Moa belonging to Apahapaitaketake. The tradition was clear and circumstantial, and was accepted by the rival claimants as genuine and trustworthy. The facts (as preserved by oral tradition), are set out fully in the final address of Sir Walter Buller, who acted as Counsel for the Ngatiapa, and whose speech was afterwards published, in pamphlet form, by Messrs. Lyon and Blair of Wellington, New Zealand.

Dr. P. L. Sclater was of opinion that, in the face of the evidence that had been brought forward in New Zealand, it could hardly be doubted that the last remaining Moa had been exterminated by man, and that, looking to the freshness of some of the remains (portions of skin, feathers, &c.), this could not have taken place at any very remote period. But, whether this had been done by the Maoris, when they first arrived in New Zealand, or by some pre-existing race was perhaps uncertain, although he had always believed that it had been done by the Maoris.

Mrs. CAREY-HOBSON suggested as a reason for the Maoris having the word "Moa" as a name for bird, that it appears that some of the New Zealand birds have a note which sounds like "Moa," for instance, the Maori hen in the bush calls "Moaraine, Moaraine," another bird "Morepork."

Mrs. Carey-Hobson found in South Africa, that the natives called several birds after their notes, as the *Bromma*-bird, the *Koor-haau*, the *Hoo-poo*, and many others.

As to other articles mentioned in the paper as also sometimes designated by the word Moa, was it possible that the bones of the bird were used in their manufacture?

Mr. WALHOUSE remarked that if the Moa existed up to comparative recent times, the remembrance of it might nevertheless have died out amongst the Maoris, and there might be no allusions to it on their traditions.

The disappearance of a conspicuous animal, once existing, from popular memory may be elsewhere paralleled. Thus the common brown bear was certainly not unfrequent in Britain during the Roman occupation, and probably for some time after, but, though speaking with diffidence, he did not know that there is any allusion to it in the early English writers, and so large an animal might have been expected to survive in popular talk and story, as it does in Germany to-day. The beaver, that probably became extinct not long after the bear, is often mentioned in Welsh poetry, but not the bear. Again, it has been surmised, though on doubtful grounds, that the gigantic Irish elk, which must have been amongst mammals what the Moa was amongst birds, may have been contemporary with the early inhabitants of Ireland; but though Irish literature and tradition go back to a great antiquity, there is no allusion to or remembrance of it.

The following paper was read by the Assistant Secretary:—

On the SHELL-MONEY *of* NEW BRITAIN.

By the Rev. BENJAMIN DANKS.

THE shell-money of New Britain is a very important factor in the life of a New Britain savage. Any account of the New Britain people, their lives and their customs, will fall short of what it should be if this important currency is not discussed.

The name of this money on the Duke of York group and New Ireland is Diwára. On New Britain it is called Tambu.

There are other kinds of money in the group. (1.) The Lideran of New Ireland, which is composed of different kinds of shell broken into flakes and ground down into circular form to

the size of an ordinary glass bead. A hole is bored through the centre of each bead, and threaded upon string. Lideran is made thus into lengths measuring from the nipple of one breast to the nipple of the other, and a length has its fixed value. Seven or eight of these will make one fathom, and in New Ireland one fathom of Lideran will purchase more than one fathom of Diwára. But the Lideran is only of local value, being considered of no account outside of New Ireland. (2.) Another kind of money is made at a place called Mioko in the Duke of York group. Its name is Pele. This is bought by the New Britain people who carry it westward to a place called Nakanai, which is about 100 miles from Mioko. Pele is of little value for general purposes either at Mioko or any part of New Britain—except, perhaps, at Nakanai, where it may form a currency. So far as we know at present its sole value lies in its power to purchase the Tambu at Nakanai. Those who make it sell it to the New Britain people at the rate of four or five lengths for one fathom of Tambu. Each length reaches exactly from the nipple of one breast to the nipple of the other as in the case of the Lideran. For the four or five lengths of Pele enough shells of which the Tambu is made, may be purchased at Nakanai to make two or three fathoms of Tambu. Pele is made of a very common pearl shell which is split up into flakes. The flakes are broken in pieces to the size of a shirt button, holes are then drilled through the centre and the flakes are ground perfectly round to one size about $\frac{3}{16}$ inch in diameter, and threaded upon string. (3.) There is another kind of money obtained in New Ireland, but from what I can gather, it is only used in the purchase of pigs. It seems to be more an article of barter, the value of which is a large pig, than a currency.

2. The shell of which Tambu is made is very small. It is procured from the people who live on the N.W. coast of New Britain. I have not been able to ascertain the exact part of the coast. In company with the Rev. G. Brown and others I went to the place where the people from the Gazelle Peninsula purchase it. When we asked the people where it was obtained they pointed us still further west. I have seen ornaments from the east coast of New Guinea, and from that fact think that possibly the shell may be found on Brooks Island between New Britain and New Guinea. When purchased at Nakanai the shells are just as they are found upon the beach or dug from the earth. They are done up in packets varying in size, and consequently in value also. The secret as to where they are obtained is very jealously kept by the Nakanai people. I have never found one man in the Gazelle Peninsula who had the faintest idea as to its whereabouts. It is evidently a trade secret, kept close by the

Nakanai people in order to prevent the Pele and other trade from passing their country.

3. When brought from Nakanai, each man sits down and threads his shells on long strips of cane. A hole is first punched through the back of the shells. The strips of cane, which are about two feet six inches in length, are scraped or pared down to the required size, and the shells are then strung. To join these pieces of cane one end of one piece is made wedge-shape. One end of another piece is split a little down the centre. The wedge end of the one piece is put between the two halves of the split end of the other piece, and a few shells are drawn over the splice, binding the two sides of the one piece on the wedge of the other. This process is repeated until all the shells are strung into one long length, which is then rolled up into coils ranging from sixty to four and five hundred fathoms. The coil is then carefully and neatly wrapped up in banana leaves and suspended in the treasure-house until required.

4. The money thus prepared is the national currency. By it trade is carried on and it enters largely into every custom and ceremony of the land. It can be, and is, divided as easily as we divide our pounds into shillings and shillings into pence. For the sake of illustration let their fathom of Tambu be represented by our £. Then half fathom = 10*s.* Quarter fathom = 5*s.*, and lowest of all two shells may represent our farthing. The length we have called a fathom is the distance between the two hands, when they are stretched out straight in opposite directions. A man is praised according to the good full measure he gives, and execrated according to the short measure he may give. The word for purchasing a thing is *kul*. The word for barter, *i.e.*, exchange of produce, is *buapa*, thus showing that the two ideas are as distinct in the minds of the natives as they are in our own.

There are fixed prices for some things. Prices for other things differ, as with us, according to the law of supply and demand. All articles of food remain at much about the same price. The following is a list of prices obtaining in New Britain :—

Salmon, large	½	fathom	Tambu.
Fowls according to size	½ to ¼	„	„
Breadfruit, sixty for	1	„	„
Taro[1] and yams according to state of crop, if plentiful, sixty for .	1	„	„
If scarce, fifty for	1	„	„

[1] In purchasing vegetable food, it often happens that a man will buy the whole of a neighbour's crop before it is dug, for a greater or smaller sum according to the size of the plantation and yield. I have purchased crops thus at from ten fathoms to twenty and twenty-five fathoms of Tambu.

Betel-nut, a large bunch	..	¼ fathom Tambu.
Twelve, betel-nuts ..	..	4 shells only.
Canoes,[1] large		20, 25, 30, 50 fathoms Tambu.
„ small		7 fathoms and upwards „
Pigs according to size, from	..	7 to 10 fathoms „
Dogs „ „ „	..	2 to 3 „ „
Cockatoos[2]	..	2 to 5 „ „
2 yards print	..	1 „ „
1 tomahawk (good) ..	..	3 to 4 „ „
Large plantation knife ..	..	3 „ „
Large fishing nets ..	..	40 to 50 „ „
Small fishing nets ..	..	1, 2, 3, 4 „ „

5. Husband and wife possess this money quite independently of each other. The children also, almost as soon as they can understand anything, are taught that the acquisition and retention of wealth is an important, if not the most important, duty of life. To let money go for nothing in return or to pay a shell more than is necessary for an article is considered the height of folly. Consequently little boys and girls have their little store and bank, and are keen traders. A wife, however, is often despoiled of her money by her husband. Not indeed by force. That would be an invasion of the rights of property, and an offence against the public conscience. The husband perhaps gets up a charge of adultery against his wife, he becomes very angry and threatens to do her bodily harm unless she pays him so much money. Often she is charged with saying something derogatory to him. She is then made to pay for "defamation of character." She pays in order to escape bodily harm at the hands of husband. Often enough the charge is true, but often it is not. In either case he gets money from her.

6. Money is lent at the uniform rate of ten per cent. It is the custom on Duke of York, that when a person wishes to borrow money he must return eleven fathoms for ten fathoms borrowed. The word for interest there is *wawaturu*, thus showing that the idea of usury is perfectly understood. On New Britain the idea is not so fully developed. I have not found on New Britain[3] a word equal to the Duke of York word *wawaturu*. *Kumbika* is the New Britain word which most resembles the Duke of York word. Its literal meaning is either a present, or to

[1] The price of canoes depends upon their quality as well as upon their size.

[2] The price of a cockatoo varies in different parts of the group. The price stated is paid in Kabakada.

[3] When New Britain is mentioned, it must be remembered that we refer to that part of it with which we are familiar. New Britain is 300 miles long, and there are many places where white men have never yet been.

present, to give, to pay. When money is borrowed, however, it is never returned without a fathom for every ten fathoms borrowed, but the idea in the native mind does not seem to be so much interest, as an expression of thanks for the favour. It amounts practically to the same thing, but there is a difference in the native mind.

7. A New Britain native has an aversion to breaking in upon his capital. If a man has a coil of money but no "change," and requiring for his present need only a few fathoms, he will take his coil and pawn it for as many fathoms as he requires. The coil is kept by the lender until the sum is repaid with interest upon which the coil is returned to its owner. This custom is called the *vuvuring*.

The people greatly deplore the loss of this wealth from the community and will do much to avert it. If a rich man is offended and threatens to remove to another town, his friends and sometimes many of the leading men of the place will pay him something to remain with them.

One man often becomes a banker for a number of men. He is generally a man who is feared and who has a reputation for valour and a good following. His house then forms a rallying point in times of trouble for all those who have lodged money there. He thus becomes a person of influence and power, because, no matter what villany he may perpetrate, the depositors rally round their money to defend it, and in so doing defend him. I do not know that he is held responsible for anything which may be missing. I have known cases where the banker has been offended by one of the depositors, and he has refused to give back the deposit, claiming it as compensation for the offence. Being feared by the offender, nothing has been done. I have also known young men deposit money with their uncle *i.e.*, their mother's brother, and the uncle has used the money as his own. There seems to be no redress in that case. I have never heard of any banker using or making away with or retaining money belonging to others except in the above cases.

8. A borrower comes more or less under the influence and power of the lender. If the borrower is a young man and has borrowed money to purchase a wife, or if a person has purchased a wife for him, he is then more or less at the bidding of the lender until the loan is repaid. All initiation fees into various clubs or societies are, as a rule, paid by the elders or chiefs,[1]

[1] I use the word "chiefs" for the sake of convenience, but the status and power of these men is far from equalling that of the Polynesian or the Fijian chief.

thus bringing the boys and young men under their influence. If a borrower shows a disposition to be restive, he is at once reminded of his obligation to pay, and the "screw" is as powerfully applied as with us. If a man refuses to repay a loan, he is thenceforth a marked man. His character is gone. He is called a "*watukum*," meaning an embezzler. None will lend him money in the future. Some young men cannot marry for the simple reason they cannot purchase a wife, and no one will lend them money because they are lazy, or have not been able to make money in the past, and there is a doubt as to whether they will be able to make it in the future.

9. *Partnerships* are entered into by the people. Two or three will own a fishtrap or a number of them, or perhaps a large fishing net. The proceeds of the sale of the produce are carefully counted at the conclusion of the day's work and equally divided, or it may be the profits are divided at the end of a season. Trading and other ventures are jointly carried on and strict accounts kept, each partner being a check on the others. The strength of their memory in money matters is astonishing. Large plantations are made by a number of people and the produce sold. The greatest source of wealth to the coast tribes lies in their trading for the shell of the Tambu, and in the products of their fishtraps and plantations.

10. *Atonement of Wrong* is made by the payment of Tambu, the amount fixed being according to the wrong done. This fact has a great restraining influence upon New Britain society. Thus:

(*a.*) When war has been carried on for any length of time, and persons have been killed or injured, no peace can be made until the friends of the killed and wounded, in the latter case the wounded themselves, have received compensation from the enemy. Each side must pay the other for damage inflicted. This reciprocal payment, if I may so call it, is shown in the word used to express both the act and the action. On Duke of York it is *wekul*. On New Britain it is *warakul*. *Kul* = buy, pay: the *we* on Duke of York, and the *wara* on New Britain denotes reciprocal action. Thus, *wekul* and *warakul* literally mean paying each other. The side which was originally wronged receives any sum mutually agreed upon in satisfaction of the original wrong out of which the war sprang, in addition to payment for whatever injury may have been inflicted during the fighting. This money is paid, not out of any public fund, but by the parties principally concerned. While so much as a single wound is not atoned for, peace cannot be considered likely.

(*b.*) Because of the lack of all constituted authority among the people, simple and ordinary quarrels lead to serious ones. There is no one man vested with power or authority who can

say "cease," when any quarrel has reached a certain stage. All peace is arranged by common agreement, mutual consent, not by personal authority. Take the following examples:—

(I.) To Meli and To Delu were two boys. To Meli put an iron ramrod into the fire, and when it was hot he drew it across To Delu's bare back. To Delu was incensed at this, and at once ran to the beach and cut down some crotons belonging to To Rumu. To Rumu was angry at the loss of his crotons, and he went along the beach and smashed a canoe belonging to another man. The owner of the canoe went and broke two canoes belonging to another man. The owner of the two canoes burnt down another man's house, and even more mischief still sprang out of To Meli's practical joking. All now thought that the matter should be settled. To Meli had to pay To Rumu for the crotons which To Delu had cut down, because by burning To Delu he had been the cause of the crotons being cut down. To Delu who had been burnt, had to pay for the broken canoe, because he, by cutting down the crotons, had caused the canoe to be broken. To Rumu by breaking the one canoe had caused the two canoes to be broken, and so he had to pay for them. The man who smashed the two canoes caused the house to be burnt down so he had to pay for that. So every account had to be settled until they found a man whose property had been injured, but who had injured none in return. His claim would then be paid and the matter ends. It will be seen that the boy who was burnt got nothing for the injury done to him. However, by cutting down the crotons he had forced To Meli to pay for them, and in causing him to lose money by such payment he found a little satisfaction; he had also involved others in loss of property which caused them to be angry with To Meli, whose position was an unenviable one for some time after.

(II.) A is a poor uninfluential man. B wrongs him. B is rich, or at any rate richer than A, and has more influence in the place. There is no government or authority to which A can apply for redress. But there is custom which has the authority of law. There are four things A can do. (1.) He can appeal to B, and if he can persuade, by promises of payment, upon a number of men to stand by him, his appeal may be listened to and his claim for compensation satisfied. If he has no backers his appeal will not be heard unless B fears further trouble. (2.) He may take the course which To Delu took in the above example. But in that case he will only have the satisfaction of getting B into difficulties, and at the same time stands a chance of having to pay something himself. (3.) He may watch his opportunity, and seize the canoe of some chief or powerful warrior of whom all are afraid: such an act is

never resisted by the owner for he will be paid, or, entering the dreaded man's treasure-house, he may take out a roll of Tambu, and taking it to his own house, he may hold it until B compensates him for the injury done. The canoe, or Tambu, or gun, or tomahawk, or whatever may be seized by A is taken much care of as he is held responsible for any harm done to it. It often happens that atonement is made at once as soon as the great warrior has been thus dragged into the quarrel. (4.) On the Duke of York Islands and sometimes on New Britain, A may go to a chief, who, as a bad, unscrupulous man, is feared, and by the presentation of a fee engage that chief to assist him. Thus:—A values the damage done to himself or his property at thirty fathoms of Tambu. He takes three fathoms of Tambu and lays them down before the chief. Each of those three fathoms represents ten fathoms. Thus A really pays beforehand the ten per cent. interest. (I am not sure that the chief gets another ten per cent. out of B when the whole loan is repaid, but it would be quite contrary to a New Britain man's nature if he did not try). If the chief deems himself capable of frightening B into repaying him, he does not hesitate to pay A the thirty fathoms represented by the three fathoms. But if he thinks this to be beyond his power, he will not risk his reputation by advancing the money. It would be a serious loss of prestige if he were to fail. If the money is advanced and B refuses to pay the chief, there are three courses open to the latter. (1.) He may seize on anything belonging to others and hold it until payment is made, thus involving others on his side against B. (2.) He may demand repayment under threat of bodily harm. (3.) He may refuse to issue more loans to anyone until payment is made by B. I have only known the latter course to be taken twice, and in each case the offender has been glad to pay, for every applicant for a loan being refused, and knowing the reason why, turns against the man who is the cause of his being sent away empty-handed.

11. All claims are adjusted by the popular voice, *i.e.*, all have a voice in the settlement. A violent man however, may frighten an offender into paying an extravagant price. As a rule, when atonement is made, the price of an article destroyed is fairly met. It sometimes happens that the injured suffer considerable loss. Women and young people who are not well backed by their friends will nearly always lose. Apart from force, there is little or no justice. Public opinion is a great factor in the adjustment of all disputes, but, as already shown, a violent man may over-ride all public opinion.

12. The manner in which public opinion is appealed to is as follows:—

The people live in families, *i.e.*, father and mother with their children, and as many of their kinsmen who may wish to live with them; each family or kinsmen having separate houses of their own, and all the houses may be enclosed by one fence, or each house may have its own fence, but erected very close to each other. Hence if one member is injured, all the family know it at once. If kinsmen are living at a distance they are informed as soon as possible of the occurrence. A man's own kin are bound to stand by him even though he be altogether in the wrong. They gather together and make a great noise, shouting and threatening the wrong-doer. This attracts the attention of the neighbours who run together to see what is the matter. The injured man and his kinsmen, together with their following, which may include as many as like to see a row, go near the place where the offender lives,[1] and send one of their number to him and his friends (who have gathered together, on the first sign of a disturbance) with terms of settlement. It may take hours to arrange the terms, two or three messengers continually going to and fro between the parties, until the affair is settled. There is no lack of communication. All the townsfolk, not personally concerned in the quarrel, are ready for the office of go-between, and seem very happy in being so employed. One, or perhaps two or three of them, may be selected, and these are recognised by both parties as fully accredited; but they have no power to dictate terms of peace. They are simply messengers from one party to the other, and the parties themselves must decide whether the terms proposed are to be accepted or rejected. The initiative is always taken by the injured person if he is able, if not then by the nearest kinsman who may be present. In the case of a woman or a child being injured, the husband, uncle (*i.e.*, mother's brother), father, or nearest kinsman or kinsmen present, take the matter up on their behalf.

The principal parties on either side are, of course, the injured person and the wrong-doer, but they are considerably influenced by their friends and following, though if the offended man choses to accept the compensation offered, he may do so even against the advice of his friends. The affair generally takes the form of a haggling bargain. A is injured by B. He sends a go-between to B with the message that he will be satisfied with, say, ten fathoms of Tambu. B gives the messenger five fathoms. This is rejected and the money goes back. B adds a little more, and this is repeated until he sends his ultimatum, that he

[1] This course is taken when reason holds sway, but if passion, then some violence is attempted at once.

will not give another shell. This is generally accepted, but if not, any of the methods of redress already mentioned may be resorted to.

If the quarrel cannot be settled without a fight, either party can obtain the help of a number of men by paying them for it, while the neutrality of any influential man, who is supposed to be likely to favour the other side, may be secured by a sufficient bribe. This is called *vitar ia* = "tying or binding him."

I am of opinion, though I am not certain, that offences against the intersexual laws based on the exogamous intermarrying divisions, viz., *Maramara* and *Pikalaba*, noted by Fison and Howitt in "Kamilaroi and Kurnai," cannot be atoned for by money payment. Death is the penalty to the woman at least. Her male relatives would be so ashamed they would kill her at once unless she could escape. But so strictly are the regulations observed, that I never knew of a case of infringement of them excepting by report. Thus, I heard of an old chief on New Ireland who broke the law; but he was too powerful and the people too few, for them to do anything but grumble about it.

13. The possession of Tambu has a very important influence on the lives of the New Britain people. Thus:—

(*a.*) *It minimises the evil and fatality of war.* The fighting is as often undertaken for compensation as for revenge, the object of the contending parties being, not so much to injure as to frighten the other side into making an offer of money. This, coupled with the fact that every life taken, and every wound inflicted in the fight must be paid for—the payment for the former ranging from fifteen to fifty fathoms, the latter according to the nature of the wound—restrains in no small degree their desire for blood. Should the wound have been atoned for and the man die afterwards from its effects, then the whole life must be paid for. In one instance an old man was supposed to be dying. Years before that a man had wounded him with a spear, and it was said that a piece of the spear still remained in the old man's body. To this piece of spear was ascribed the old man's illness, and if he had died the man who speared him would have had to pay for the life. While this law of atonement restrains their thirst for blood in a great measure, it must still be borne in mind that not a few cases arise, in which rage, desire for vengeance, and jealousy override all prudential and economic considerations and only life and blood can satisfy the infuriated man. Cruelty and lust abound in New Britain even with this powerful restraint, and one who is at all acquainted with a New Britain man cannot but shudder at the very thought of what he would be if the restraint were not.

(*b.*) *It establishes personal right to property,* and the right to alienate that property by sale or gift independent of anyone else. The whole town or family may be against the sale or gift, but has only the power to protest and cannot prevent it if the person is determined to sell. This right extends even to women and children. The writer has purchased land (for mission purposes) from women who insisted upon selling even against the wish of their friends. The sale completed, its validity has been recognised. I have known persons who have objected to the sale of a thing make a present to the owner of a fathom, and sometimes more, of Tambu to induce the owner not to sell. A native generally listens to that argument.

(*c.*) *It makes the people frugal and industrious.* No man is held in greater contempt than a spendthrift. In point of fact such a person is scarcely known. Nothing is wasted. In purchasing, a man will only buy just as much of anything as he requires for the time being. Hence we see no wholesale business done. One venture at a time is the business maxim of the New Britain people. Plantation produce is the one source of wealth for the inland people. A bunch of bananas will bring, according to size, from a quarter to a whole fathom of Tambu. Cocoa-nuts from sixty to one hundred per fathom. Hence the inland people are nearly always at work at their plantations. They are either in them, or preparing something in connection with them, or selling the produce. Market is held on the coast every third day in a large number of places. Those who live very far back inland have their inland markets where they sell to those nearer the beach, who in turn sell what they buy to the coast people. These markets are so arranged that two are seldom held near each other on the same day. A man taking his produce to one market to-day, may take more to another to-morrow if he is so disposed, and it is safe for him to do so. The coast people meet the inland people at these markets with their fish and articles of European manufacture, and either sell them for Tambu or barter for food and other things only obtainable in the country.

On the coast, fishing, in addition to plantations, is a source of income. The fishtrap is unique, and takes two or three weeks to make, and when finished it is quite a work of art. It costs in all, including the cost of food and wages for those who assist, and the cable to anchor it by—often 500 fathoms long—about six or seven fathoms. Men work from early morning till late at night making these traps. By the time the traps are made plantations require attention. Only those who know nothing about the New Britain people will call them lazy. After a residence of nearly eight years among them the writer has arrived at the conclusion

that, comparatively speaking, they are as busy as Europeans are. There are and have been parts of Duke of York, New Ireland, and New Britain where enforced idleness and therefore want and wretchedness existed in the most debasing degree. But when Christianity has stepped in and made peace where peace was scarcely ever known, idleness gave place to industry and wretchedness to comparative comfort and wealth. The innate industry of the people shone forth the moment property and life became in any degree safe. I have known a man make fifty fathoms of Tambu during the fishing season, and ten or twelve fathoms from his plantations.

(*d.*) *It makes them a commercial people.* By the aid of intermediaries their commercial transactions extend to places they have never visited. But they never, or very seldom, trust their money with the intermediary. He buys the article with his own money and sells it to them for theirs, making what profit he can by the transaction. In the old heathen days Kinawanua people, a town on Duke of York Island, could go to one town on New Ireland and there trade for goods from that place and sell their own. Waira, another town, had its place also. Nakukuru people could cross over to three places on New Britain and do their trading. It is needless to say that through the establishment of mission stations in each town, trade is now carried on between New Britain and other parts of the group with almost perfect freedom. A bargain once made and concluded is seldom or never disputed. All disputation and haggling is done previous to the conclusion of the bargain.

14. While Tambu has brought some benefit to the New Britain people it has not been an unmixed blessing. To it, or rather to love for it, may be attributed in no small degree their intense selfishness and their glaring ingratitude. The expression of gratitude often leads to a little expense. Hence gratitude is too expensive a luxury for a New Britain man to be acquainted with. A spirit and life which is unselfish must often suffer loss. A New Britain man cannot afford that. A people whose greatest love is reserved for money, and whose highest aim is to get money, is an exceedingly hard-hearted and an intensely selfish people.

15. There are other matters closely connected with this shell-money. Its influence is supposed to extend even to the next life. There is not a custom connected with life or death in which this money does not play a great and a leading part. I am convinced that the man who best understands the uses and power of Tambu, be he missionary or trader, will carry the greatest influence amongst the people, because in understanding

that subject he will be led almost into the secrets of their very hearts, and their life will be understood by him as though it were spread out before him as a chart. Take away their money and their secret societies sink at once into nothing, and most of their customs become nothing. I do not pretend to have exhausted the subject in this paper, and hope that some missionary resident in New Britain will make Tambu a subject of special study, and give to ethnologists complete information on this subject, which a student of island customs has called "commercial savagery" and "a new and most interesting phase of savage life." Not that money of this kind is unknown elsewhere, but that nowhere else, so far as we have hitherto been informed, has it so powerful an influence on savage life and custom.

JANUARY 10TH, 1888.

FRANCIS GALTON, Esq., F.R.S., *President, in the Chair.*

The Minutes of the last meeting were read and signed.

The election of MONTUORI JOSEPH OLGERS, Esq., Assistant Professor of English Literature in the Government College, Lahore, was announced.

The following presents were announced, and thanks voted to the respective donors:—

FOR THE LIBRARY.

From the PREMIER OF VICTORIA.—Prodromus of the Zoology of Victoria. By Frederick McCoy. Decades I–XV.

From the DEPARTMENT OF MINES, NEW SOUTH WALES.—Annual Report for the year 1886.

—— Geology of the Vegetable Creek Tin-Mining Field, New England District, New South Wales. By T. W. Edgeworth David, B.A., F.G.S., Geological Surveyor.

From Mrs. CRAWSHAY.—Essays written for the Byron-Shelley-Keats In Memoriam Yearly Prizes for the best essay in English written by a Woman. Jubilee edition.

From the AUTHOR.—Notes on the Ethnology of British Columbia. By Dr. F. Boas.

—— The Eskimo Tribes. By Dr. Henry Rink.

—— Preliminary Report on the Marine Fauna of Rámeswaram, and the neighbouring Islands. By Edgar Thurston.

From the AUTHOR.—Abnorme Eberhauer, Pretiosen im Schmuck der Südsee-Völker. By Dr. O. Finsch.
—— Czaszki Przedmieszczan Krakowskich, z xvii, i xviii wieku. By Prof. Dr. I. Kopernicki.
From the SCOTTISH GEOGRAPHICAL SOCIETY.—The Scottish Geographical Magazine. Vol. iv. No. 1.
From the BERLIN GESELLSCHAFT FÜR ANTHROPOLOGIE, ETHNOLOGIE, UND URGESCHICHTE.—Zeitschrift für Ethnologie. 1887. Heft v.
From the ACADEMY.—Bulletin de l'Académie Impériale des Sciences de St.-Pétersbourg. Tom. xxxii. No. 1.
From the ASSOCIATION.—Journal of the Royal Historical and Archæological Association of Ireland. No. 69A.
From the INSTITUTION.—Journal of the Royal Institution of Cornwall. Vol. ix. Part 2.
From the SOCIETY.—Proceedings of the Royal Society. No. 259.
—— Journal of the Royal Asiatic Society. Vol. xx. Part 1.
—— Proceedings of the Royal Geographical Society. 1888. January.
—— Journal of the Royal Geological Society of Ireland. Vol. xviii. Part 2.
—— Journal of the Society of Arts. Nos. 1830–1833.
—— Proceedings of the Society of Biblical Archæology. Vol. x. No. 2.
—— Boletim da Sociedade de Geographia de Lisboa. 7ª Serie, No. 2.
—— Notulen van de Algemeene en Bestuurs-vergaderingen van het Bataviaasch Genootschap van Kunsten en Wetenschappen. Deel xxv. Aflevering 3.
From the EDITOR.—Nature. Nos. 946–949.
—— Journal of Mental Science. No. 108.
—— American Antiquarian. Vol. ix. No. 6.
—— Science. 252–255.
—— Photographic News. Nos. 324–327.

The PRESIDENT announced that the Annual General Meeting would be held on Tuesday, January 24th, and nominated Mr. E. W. BRABROOK and Mr. J. E. KILLICK, Auditors.

Miss BUCKLAND read the following paper:—

On TATTOOING.

By A. W. BUCKLAND.

[WITH PLATE VI.]

THE subject of tattooing does not appear to me to have occupied the attention of anthropologists as much as its importance war-

rants. I therefore propose in this paper to bring forward a few facts in connection with it, which seem to strengthen the chain of evidence bearing upon that prehistoric intercourse which I believe to have existed between widely-separated peoples.

Falling under the head of ornament, it seems probable that this painful mode of personal adornment was adopted at a very early period of human history, and was at one time almost universal, falling into desuetude with the advance of civilisation when clothing became general, and ornaments were chosen which would not entail pain, and could be varied according to the caprice of the wearer. But even to the present day tattooing forms the *dress* of the great mass of the unclothed natives in various parts of the world, whilst in some places it is more than a personal adornment, forming a ceremonial rite accompanying initiation into manhood. In some places men only are tattooed, in others women alone are thus adorned; but there is generally some story or legend given to account for the preference awarded to one sex over the other, as, for example, in Samoa, where Mr. Turner[1] tells us that Taema and Tilafainga, or Tila the *sportive*, were the goddesses of the tattooers. They swam from Fiji to introduce the craft to Samoa, and on leaving Fiji were commissioned to sing all the way, "Tattoo the women but not the men." They got muddled over it in the long journey and arrived at Samoa singing, "Tattoo the *men* and not the women;" and hence the universal exercise of the blackening art on the men, rather than the women.

There are two principal modes of tattooing. In the one which is probably the oldest, cuts are made in the flesh in such a manner as to leave a cicatrised mark, but generally without the addition of any colouring matter. In the other a pattern is drawn on the skin, which is afterwards pricked in with needles or other sharp pointed implements, various colouring matters being rubbed into the wounds, so as to produce a permanent picture.

The first method prevails in Australia, where many of the natives are scarred in a remarkable manner, some of those exhibited in England last year having the shoulder cut and scarred, so as to resemble a great tassel, like a footman's shoulder-knot. But although the custom of thus gashing the shoulder, back, and breast seems in some parts of Australia to be almost universal, it does not appear to be connected with the elaborate initiation ceremonies; it may, however, probably have a tribal signification. This mode of tattooing by cuts,

[1] "Samoa," by George Turner, LL.D., page 55.

leaving raised cicatrices, which Mr. Tomkins suggests should be named *gashing*, prevails with modifications, all over the African continent. On the west coast, three cuts on each cheek would appear to be the chief decoration, and these cuts are coloured red and blue, according to the masks and other representations brought over for the Colonial and Indian Exhibition.[1] It is not a little singular that these three cuts appear in a bronze head of great antiquity from the Necropolis of Marzabotto, Bologna, Italy. This head is engraved in the Smithsonian Report of the Bureau of Ethnology for 1882–83, from which I have taken some of the material for this article. I cannot meet with any account of the origin of these three cuts, but believe they may perhaps have some religious as well as tribal significance, for Dr. Holub, speaking of similar cuts on the breast of a Koranna says :—" They have among themselves a kind of freemasonry. Some of them have on their chest three cuts. When they were asked what was the reason of it, they generally refused to answer; but after gaining their confidence they confessed that they belonged to something like a secret society, and they said 'I can go through all the valleys inhabited by Korannas and Griquas, and wherever I go when I open my coat and show these three cuts I am sure to be well received.'"[2] Mr. Johnston gives a sketch of a Mu-ngala from the equator whose body was entirely covered with cicatrisations, which he says are produced by raising lumps or wheals of skin by slitting it with a knife and rubbing some irritant into the incision," and he tells us that this mode of ornamentation is practised right along the course of the Congo up to the Stanley Falls. The marks thus made are tribal. " Thus," he says, " the Batéké are always distinguished by five or six striated lines across the cheek-bone, while the Bayansi scar their foreheads with a horizontal or vertical band."[3]

The Andamanese, who also practise tattooing by means of gashing, do so, according to Mr. Man, first by way of ornament, and secondly to prove the courage of the individual operated

[1] Mr. Griffith in his paper on Sierra Leone ("Journ. Anthrop. Inst.," February, 1887, page 309) says, "The girls are cut on their backs and loins in such a manner as to leave raised scars which project above the surface of the skin about one-eighth of an inch. They then receive Boondoo names, and after recovery from the painful operation are released from Boondoo with great ceremony and gesticulation by some who personate Boondoo devils with hideous masks, &c. The girls are then publicly pronounced marriageable." Mr. Phillips explained after his paper on November 8th, 1887, the mode in which these gashes are made: he said with a needle and a knife, the needle being inserted under the skin and gashes cut across it with the knife, sand being rubbed into the cuts to produce the raised appearance.

[2] "On the Central South African Tribes," " Anthrop. Journ.," August, 1881.

[3] " The River Congo," H. H. Johnston, page 420.

upon, and his or her power of enduring pain. Women are the chief operators, and they now use a piece of glass to make the incisions, but formerly a flake of quartz. They commence tattooing children about their eighth year, and the process is not completed till they are sixteen or eighteen; but they never tattoo the face, neither do they rub any pigment or other preparation into the wounds. Although no particular ceremonies accompany the operation. the marks here as in Africa would appear to be tribal, for Mr. Man tells us of three tribes who may be specially distinguished by three rows of cuts down the back and chest, and "although women do the greater part of this work, the three lines down the back are almost exclusively made by some male friend with the *ōla* or pig-arrow; and except the three lines in front, the women of these tribes have no special marks, but are covered like the females of South Andaman with small raised cuts, which are inflicted by their own sex with the ordinary glass or quartz flake, and not with the pig-arrow."[1] In another tribe the central row of cuts down the back is omitted, and in another the whole body is covered with perpendicular and horizontal cuts.

In the Admiralty Islands, Mr. Moseley tells us that "the males are mostly marked with cicatrisations on the chest and shoulders," in the form of circular spots about the size of half-a-crown, which are often continued down the back in two lines meeting in the middle, and these marks appear to be assumed only at adult age, but "the women are all tattooed, with rings round the eyes and all over the face, and in diagonal lines over the upper part of the front of the body, the lines crossing each other so as to form a series of lozenge shaped spaces." This tattooing is done with *short cuts*, probably with obsidian flakes, and are all coloured indigo blue, but it is scarcely visible at a distance and does not form coloured patches as in the Fijian women and Samoan men.[2]

The Solomon Islanders also tattoo in this manner with short cuts.

In Timor Laut, Mr. Forbes tells us, "both sexes tattoo a few simple devices, circles, stars, and pointed crosses, on the breast, on the brow, on the cheek, and on the wrists; and scar themselves on the arms and shoulders with red-hot stones in imitation of immense small pox marks, in order to ward off that disease." But, he adds, "I have, however, seen no one variola-marked, nor can I learn of any epidemic of this disease among them."[3] It may therefore be interesting to compare these marks,

[1] "Anthrop. Journ.," February, 1883, page 334.
[2] H. N. Moseley "On Admiralty Islands," "Anthrop. Journ.," May, 1877.
[3] "Anthrop. Journ.," August, 1883, page 10.

with those described above as in use in the Admiralty Islands, which they seem to resemble.

We turn now to the other species of tattooing, being that most commonly known by that name, in which a pattern is first drawn and afterwards pricked into the flesh, various colours, but chiefly indigo blue, being rubbed into the wounds, thus forming indelible marks. This mode of adornment is found very widely spread, but it reaches its culminating point in New Zealand, where it may be said to attain the position of a fine art, the tattooing for each part of the face being known by a separate term. The blue dye used by the Maories in tattooing is made from the soot obtained by burning the heart of certain trees.[1] The designs consist of curved lines, which frequently cover the entire face, even extending over the eyelids. The process is extremely painful, and can only be done by degrees, so that years are occupied in completing the operation, the instruments employed being of sharp human bone. Tattoo marks were looked upon as signs of dignity and denoted a warrior.[2]

The nearest approach to the New Zealand tattooing appears to be that practised among the Nagas of India, of whom Col. Woodthorpe writes, "they would be good looking as a rule, but for the tattooing which in some cases makes the faces almost black; in others the tattooing is blue, and then the bare portion of the face, especially in those of fair complexion, appears pink by contrast. The tattooing on the face is called 'Ak,' and consists of four continuous lines carried across the forehead, round and underneath the eyes up to the nose, back over the cheeks, and round the corners of the mouth to the chin; rows of spots follow the outside lines and two fine lines mark out the nose, in a large diamond space."[3] Some of the Naga tribes do not tattoo the face, but only the breast, shoulders, back, wrists, and thighs. The women are also tattooed more or less, but among the Angamis and other Eastern tribes, we find very elaborate designs, consisting of lines on the breast, from which proceed eight lines to the waist, gradually narrowing to a point; the thighs are covered with close vertical lines, with horizontal lines on the calves. This curious tattoo, which has the appearance of tight fitting breeches, extends to Borneo; and there is in the British Museum a painting from "Head Hunters of Borneo," repre-

[1] Mr. Kerry-Nicholls in "Anthrop. Journ.," November, 1885.

[2] It has been said, and probably with truth, that the tattooing of the bodies of chiefs and warriors was for purposes of identification, in case the head should be cut off by the enemy in battle, and this is particularly noticeable in New Zealand, where we are informed that every mark or line tattooed on the face of a chief is repeated on the body.

[3] Colonel R. G. Woodthorpe, R.E., "Anthrop. Journ.," February, 1882, p. 208.

senting a Tring Priestess thus adorned. Of this curious ornament, Colonel Yule writes: "The practice of tattooing has been too generally diffused to build anything on its existence. But there is an application of it so peculiar and remarkable, that it is worth while to notice its coincident existence among races both of the continent and of the islands. This consists in covering the skin from the waist to the knee with dark embroidery; in fact tattooing *breeches* upon the body. In spite of a thousand years at least, perhaps much more, of Indian religion and influence, every male Burman is thus adorned. In Borneo among certain tribes, the women have precisely the same decoration."[1]

In New Guinea, the Motu women are very elaborately tattooed in geometrical patterns. Some of the men are also tattooed, but in this case it denotes, as in New Zealand and among the Nagas, that they are warriors, and have slain one or more enemies; and Mr. Lawes says, "It is no uncommon thing to hear men quarrelling, and one saying to the other, Who are you that you should talk? Where are your tattoo marks? Who have you killed, that you should speak to me?" In New Guinea, the tattooing is done by marking out the pattern in lamp black and then puncturing the skin by lightly tapping a thorn on it. Tattooing seems formerly to have been in almost general use among the Indians of North America, but is now almost confined to the Haidahs of Queen Charlotte Islands and Alaska: it exists also among the Eskimos, and Greeley reports meeting a boat filled with Eskimos from the west of Davis Strait, one of whom was tattooed. The tattooing of the Haidahs differs from that of most other races, the patterns consisting chiefly, if not wholly, of animal forms instead of geometrical patterns; these animal forms are the totems of the tribe, and are repeated on the pillars erected before the door of the chiefs, but they are conventionalised representations, bearing a strong family resemblance both to the carvings of ancient Mexico and Central America, and to those of New Zealand at the present day; a likeness which could not fail to strike those who compared them, as exhibited in the Colonial and Indian Exhibition: the chief difference was, that the Haidah totem posts were highly coloured, whilst those of New Zealand were of natural wood, polished. I referred to the peculiarities of these totem posts, in my paper on "American Shell Work and its Affinities," and need not therefore say more on the subject now, excepting to draw attention to these resemblances as bearing upon a peculiarity connected with the art of tattooing. In the very fine portraits of Maories exhibited in the New Zealand Court of the Colonial and Indian

[1] "Anthrop. Journ.," February, 1880, page 294.

Exhibition, the peculiarities of New Zealand tattooing were well depicted, and it might have been observed, that whilst the faces of the chiefs were covered with ornamental designs, the women were tattooed only on the chin, and the faces of young girls were not tattooed at all.[1] The tattooing of the chin and lips of women, we were informed, took place only after marriage, and in fact like the wedding-ring among ourselves, denoted marriage. Now, this custom is not confined to New Zealand, but has a very wide range, and I quote a few instances from the article already alluded to on "Pictographs of the North American Indians" in the Annual Report of the Bureau of Ethnology for 1882–83. "Captain John Smith (1819), says of the Virginia Indians. 'They adorne themselves with copper beads and paintings. Their women have their legs, hands, breasts, and faces cunningly imbroidered with divers workes, as beasts, serpents, artificially wrought into their flesh with blacke spots.'" The Innuit, according to Cook, tattooed perpendicular lines upon the *chin of women*, and sometimes similar lines extending backwards from near the outer portions of the eyes. M. Gatschet reports that among the Klamath, the women have three lines, one from each corner of the mouth, and one down over the centre of the chin. The Modoc women tattoo three blue lines extending perpendicularly from the centre and corners of the lower lip to the chin. Stephen Powers says, that the Karol California squaws tattoo, in blue, three narrow fern leaves perpendicularly on the chin, one falling from each corner of the mouth and one in the middle. The same author says, "The squaws (Patáwat, California) tattoo in blue three narrow pinnate leaves perpendicularly on their chins," and the women of the Wintuns, another Californian tribe, tattoo three narrow lines, one falling from each corner of the mouth and one between. The "Report of the Pacific Railway Expedition," Vol. iii, says, "Blue marks tattooed upon a Mojave woman's chin denote that she is married." Bancroft says, of the Eskimo, that the females tattoo lines on their chins; the plebeian female of certain bands has one vertical line in the centre, and one parallel to it on either side. The higher classes mark two vertical lines

[1] The custom however appears to vary, for I am informed that in some parts of New Zealand no importance is attached to tattooing, which is done, as with ourselves, simply as a fancy, some young girls being tattooed round the eyes. From the fact, however, that there is a special name in Maori for the tattooing of every part of the body, it would seem to have been originally ceremonial in origin. The female tattooes are for the breast, the thighs, and the chin, the latter being the principal. See "Te Ika a Marie," by Rev. Richard Taylor, page 321, &c. Mr. Taylor believes tattooing to have originated in consequence of the chieftains being of a lighter race and having to fight side by side with their black slaves, so in order to make themselves appear of the same race they blackened their faces, and when wars became very frequent they made these marks indelible to save the trouble of constant blackening.

from each corner of the mouth. The Kuskoquim women sew into their chin two parallel blue lines. On the Yukon River among the Kutchins the women tattoo the chin with a black pigment.[1] Nordenskiöld ("Voyage of the Vega") says, the Chukché women are tattooed on the face, especially the chin, the men are not tattooed, but have sometimes a black or red cross painted on the cheek. The true Chukchés are reported as living on the coast of America, north of Behring's Straits. They insert bones in the lips and in the sides of the mouth, and have articles of nephrite like that from High Asia.

Mr. Everard im Thurn speaks of the tribal tattoo mark at the corners of the mouths of the Indians of Guiana, but does not speak of these marks as confined to women: the women of that country, however, represented in the Colonial and Indian Exhibition, had distinctive marks on the lips and round the mouth extending across to the ear, but whether of paint or tattoo markings, could not be certainly known.

Turning now to the eastern hemisphere, we find among the Ainos of Japan, that the women tattoo their chins, as it is said to imitate the beards of the men, and among the fellahs of Egypt, and the labouring people of the cities, the women tattoo their chin, forehead, breast, hands, and feet. In Upper Egypt most women puncture their lips to give them a dark bluish tinge.[2] Among the Nagas of India we are told, "the women all tattoo slightly; fine lines are drawn on the chin, the outer ones being tattooed from the corners of the mouth."[3]

This tattooing of the chin appears also on the Motu woman of New Guinea depicted in the "Anthropological Journal" for May, 1878.

Drawing together the threads offered by the foregoing facts, we may, I think, assume, that tattooing by *cicatrisation* exists chiefly among the *black* races; that the marks are *tribal*, although in some cases they denote membership of a secret society, a sort of freemasonry, of great service to the possessor; that tattooing, as it exists in New Zealand and among the Pacific Islands, is chiefly ornamental, and in the men honourable, denoting bravery in battle; but the pattern employed has also a distinct reference to some event, as well as being tribal; whilst in the women, the tattoo mark on the chin almost always denotes marriage. So general does this custom of tattooing the chin in women seem, that it would appear possible by it to distinguish the sex not only in the living individual, but in

[1] "Native Races," Vol. i, pages 48 and 72.

[2] See Featherman's "Social History of the Races of Mankind," Vol. v, page 545; and "Science," III. No. 50, page 69.

[3] "Anthrop. Journ.," February, 1882.

paintings and sculptures. The wide distribution of this peculiar custom appears to me of considerable significance, especially as it follows so nearly in the line I have indicated in two previous papers as suggestive of a pre-historic intercourse between the two hemispheres. "If," says Max Müller, "we find the same words with the same meanings in Sanskrit, Persian, Armenian, Greek, Latin, Celtic, Slavonic, and Teutonic, what shall we say? Either the words must have been borrowed from one language by the other, or they must have belonged to an older language from which all these so-called Aryan languages were derived." This, using customs instead of languages, is what I have endeavoured to show in this and other papers. When we find in India, Japan, Egypt, New Guinea, New Zealand, Alaska, Greenland, and America, the custom of tattooing carried out in precisely the same manner and for the same ends, and when in addition to this we find a similarity in other ornaments, in weapons, in games, in modes of burial, and many other customs, we think it may fairly be assumed that they all derived these customs from a common source, or that at some unknown period, some intercourse existed of which these things are the surviving traces.

The antiquity of the art of tattooing is undoubted. Herodotus speaks of it as used by the Thracians, and I have always held that the Picts were probably tattooed, and perhaps the ancient Britons likewise, and that geometrical patterns and other markings similar to those still in use in New Zealand and North America found on ancient stone monuments in Europe, probably denoted the tribal mark or totem of chieftains, as tattooed or painted upon their persons, but this of course, except from analogy, must remain a conjecture. Doubtless as at the present day, tattooing died out rapidly after contact with civilised races; but it is somewhat singular, that no trace of tattooing as far as I am aware is to be found among the Egyptian, Assyrian, Greek, and Roman paintings and sculptures, although these civilised nations must have come in contact with tattooed peoples, unless it had not at that period spread into the regions depicted by them. The bronze head before alluded to as found in the cemetery of Marzabotto, Bologna, is the only one I know in which tattoo marks, or rather the *African tribal cicatrices* on the face, are distinctly to be seen. Mr. Swan, who in his article on the Haidahs, reproduces this bronze head, fancies he sees something like tattoo marks on one of the vases found by Dr. Schliemann; and I believe it can be plainly traced on some of the Peruvian vases. I pointed out in a note to my paper on American Shell Work, the strong similarity between the tattoo marks of the Nagas as pourtrayed by Dr. Watt in the Colonial and Indian

Exhibition, and those on the curious shell masks found in grave mounds in America; and a still more remarkable coincidence in connection with the subject of this paper has since come to my notice. The shell masks of which I have spoken, have diagonal lines across the cheek, and some have a hole with a line or two lines proceeding from it and sometimes two others crossing it extending over what may be supposed to be the chin. Now it is a singular fact that exactly the same mark appears on the chin of the gigantic stone image from Easter Island now under the portico of the British Museum. Whether these marks represent tattooing as affirmed by Mr. Dall, and whether then, as now, these markings on the chin denoted a female, must be left to further investigation, but it is a subject worthy I believe of the especial notice of travellers and antiquaries, for it appears to me of great anthropological interest. The implements employed are also deserving of notice, being in many places fragments of human bone, but of these I cannot treat in the present paper.

Since writing the above, I have been favoured with a sight of a book recently published by Herr Joëst, on the subject, and if the plates given of Japanese tattooing are not supplemented by painting, it must be conceded that the Japanese are the most skilful tattooers in the world. The patterns resemble those on Japanese silks, and might readily be mistaken for a tight fitting garment of that material. Such, indeed, seems to be the design, as it is only in use, we are told, among the lower orders, and takes with them the place of garments.

Explanation of Plate VI.

Map of the world, illustrating the distribution of tattooing. In this map the dark shading by *horizontal* lines represents the distribution of tattooing by means of gashes; the medium shading by *vertical* lines, the ordinary tattooing by puncture, with colouring matter rubbed in; the light *dotted* areas represent countries where traces of ancient tattooing are mentioned in the paper; and the three strong lines from *left to right* denote those places in which travellers have noticed the tattooing of the chins of women, chiefly in token of marriage. The scale of the map is too small to mark each place distinctly, especially the one spot in Italy alluded to in the paper.

Discussion.

Lieut.-Col. Kincaird remarked that Miss Buckland in her valuable paper had referred to the practice of tattooing among the tribes of Nagas in North-Eastern India, but it might be of interest

to remark that the speaker's observation led him to believe that this custom, though in a partial manner, on the arms and legs is wide spread among the women of the lower castes of the Tamil, &c., races in the south and south-east of the peninsula. Among the ethnically allied so-called aboriginal tribes inhabiting the Vindyan and Suthpura Hill slopes it is also prevalent, even among the women of the lower order of Mohammedans, whose forefathers were probably low caste Hindoos before being converted by force. The speaker had observed the same tattoo markings on arms and legs. There is very generally a dot on the chin and similar dots on the cheek or temple very sparingly placed, forming perhaps in their ideas beauty spots, similar to the patches of our ladies in former years.

With reference to possibly early intercommunication of tribes referred to in the paper, there is the curious fact of the Dyak tribes of North-Eastern Borneo using similar weapons to those in use by certain tribes of the head waters of the Amazon; now the blow pipe alluded to is a very skilfully constructed weapon, as proved by some in the speaker's possession. The blow pipe is made of the hardest wood of the forest, eight to ten feet long, bored most accurately with close fitting poisoned arrows. It is curious that tribes so dissimilar in manners, customs, and appearance should have hit upon identically constructed weapons so different to the usual axes, bows and arrows, and spears of most savages.

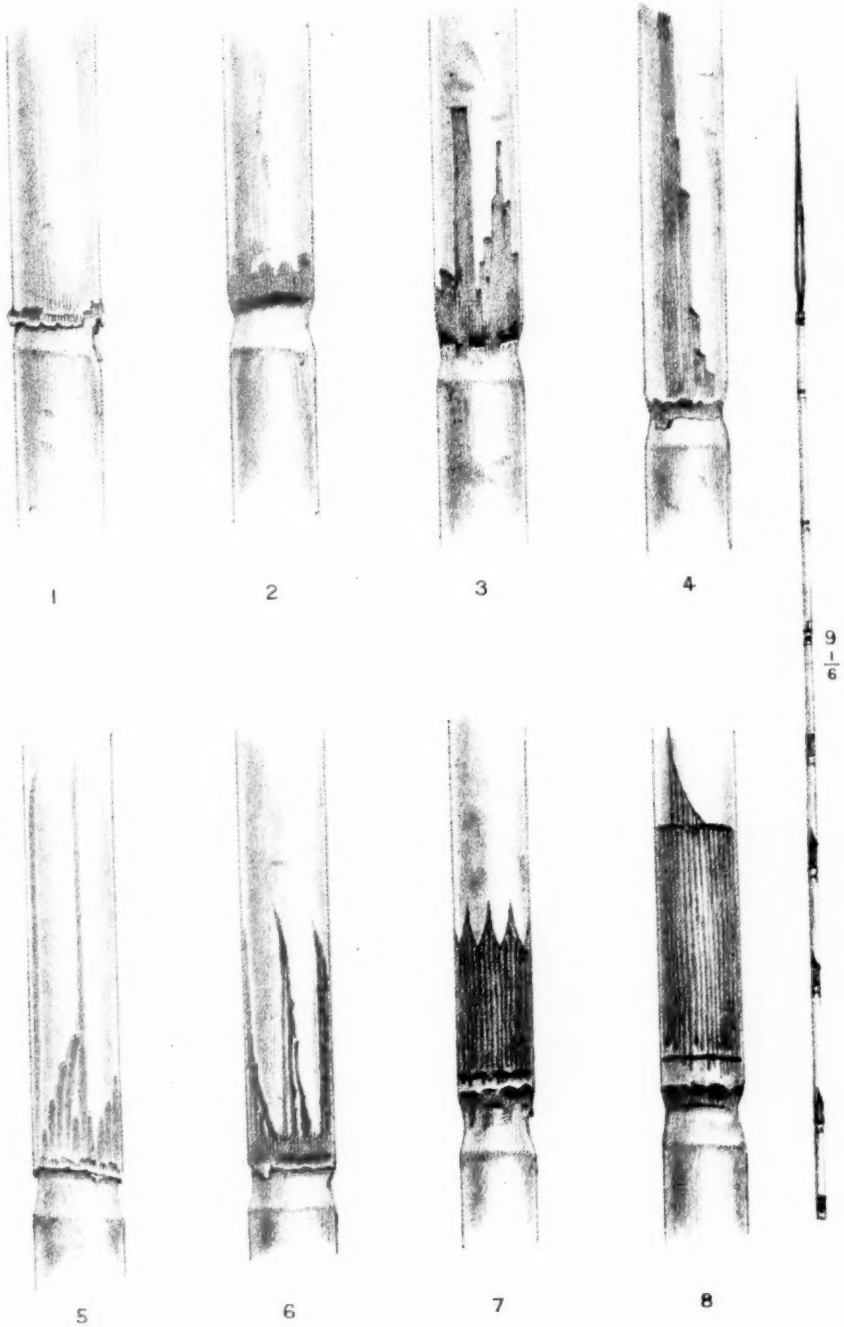
The following paper was then read :—

On the EVOLUTION *of a* CHARACTERISTIC PATTERN *on the* SHAFTS *of* ARROWS *from the* SOLOMON ISLANDS.

By HENRY BALFOUR, M.A., F.Z.S., Assistant to the Curator of the Pitt Rivers Museum at Oxford.

[WITH PLATE VII.]

HAVING recently had the opportunity of observing a large number of arrows from the Santa Cruz and Solomon Island groups, forming a section of the fine arrow series recently arranged in the Pitt Rivers Museum at Oxford, I was struck by the persistence of a certain incised pattern on the shafts of the greater number. The constant recurrence of this design, which, though showing many modifications in complexity and finish, is essentially the same throughout the series, suggested that it must originally have had some definite significance. Either it might have originated in some natural peculiarity or imperfection, the outline and position of which suggested a rough ornamentation; or in some artificial modification of the shaft



H Balfour Del

ORNAMENTED REED ARROW-SHAFTS.

which served a useful purpose; or lastly, it might have been developed from some previous design which represented some real object. In a lecture[1] delivered before the Royal Institution of Great Britain, Colonel Lane-Fox described a series of paddles which showed the stages of gradual degeneration in successive copyings of a design representing the human form, and how, by the loss of its attributes, it became reduced at length to a simple crescent, a purely conventional pattern.

In the series of arrows which I have selected for the purpose, I have been able to trace what I believe to be the stages of evolution of the pattern which occurs so characteristically upon them; not from some pre-existing design, but from a useful modification of the shaft, necessary for the perfection of the arrow itself.

The position of the design is invariably immediately above the joints of the reed of which the shaft is made; it usually consists in the fully developed pattern of a number of incised straight lines, blackened, and running parallel to the length of the shaft so as to form a band round it. The length of the parallel lines is limited by tranverse lines round the shaft. These are the characteristics of the design, but many modifications occur, varying in their complexity according to the artistic taste of the designer.

In the series of arrows which I have figured, the first (Plate VII, Fig. 1) is one in which the joints are untouched, except to remove the leaves, and they remain rough and jagged. This must have proved an inconvenience in shooting, as the arrow in passing over the hand on which it rested, would have rasped it, even if the roughness did not interfere with the accuracy of flight.

An obvious improvement was to pare down these rough edges, and leave the whole surface smooth. Fig. 2 shows a joint of a Santa Cruz arrow trimmed in this way. The fibrous substance of the stem appears as the silicious exterior is removed in the process. Now, from the fibrous nature of the substance of the reed, there would be a tendency for narrow strips to peel away along the length of the shaft when started by an incision, in the attempt to remove small shavings. To prevent this peeling extending far, cross notches were cut as represented in Fig. 3, Plate VII, the peeled lines varying in length.

By careful manipulation the length of the lines was controlled, and varied at the will of the native, and two clusters of lines were arranged symmetrically, one on each side of the shaft, each

[1] "On the Evolution of Culture," by Col. A. Lane-Fox. "Proc. Royal Institution," May 28th, 1875, Vol. vii, page 516.

group being composed of from five to eight lines of graduated length. Here, then, the condition of *ornament* has been reached, and this state is further marked in this specimen (Fig. 4, Plate VII) by the fact of the lines having ceased to be in connection with the actual joint, and commencing a trifle above it. The paring down of the joint is here performed by a distinct process, extra care being taken not to encroach upon the pattern by peeling as before.

At this stage, moreover, we find that the design is artificially picked out in black colour. The rough fibrous layer exposed in peeling, would tend, in the continual use of the arrow, to become soiled and darkened, while the silicious outer coating would have remained clean and light coloured, because of its smoothness, the lines would thus have been thrown up conspicuously, suggesting the idea of artificially blackening them to emphasise the pattern.

In Fig. 5, Plate VII, the number of the groups of lines is seen to be increased, five of them being arranged round the stem. Each group consists of one very long line and a few shorter at its base. Here, again, we find evidence of the pattern having lost utterly its original significance, for the joints in this specimen are left rough and jagged as in Fig. 1. Possibly this may be an unfinished arrow, and would have been trimmed as in Fig. 4, but, nevertheless, it exemplifies the want of connection at this stage between the design and the act of trimming the joint, from which it was evolved. In Fig, 6, Plate VII, there are six groups of lines disposed round the shaft, shorter than the last and more compact in arrangement; the lines, too, are fine and incised, and not the result of scraping or peeling. By the coalescence of the bases of these groups an arrangement is arrived at, as in Fig. 7. The design here forms a complete band round the shaft, the points alone of the groups remaining free. In Fig. 8, the whole is seen to be filled in, the close parallel lines are bounded by circular transverse lines and no trace of the grouping remains. In this specimen too it is interesting to note that, above the band and resting on it, the old design has been reintroduced at a stage represented in Fig. 6, the upper circular line of the band representing the line of the joint from which the first design sprang. Fig. 9 represents the full length of the arrow of which a portion is figured in Fig. 8, and shows the distribution of the design on the shaft. Four of the articulations are ornamented with it, while a fifth has a very slight design, which may possibly be either a degenerate form of the ordinary pattern, or one that has been evolved from the same source, but through a different series of stages of development.

There are a great many varieties of the pattern of which the

development has been traced, but all are modifications of the same type, and vary but in detail and workmanship.

In the series which I have selected and figured, the more marked phases are alone given, but in a larger series an almost continuous series of gradations can be shown.

The use of a reed or bamboo shaft for arrows and spears is very widely distributed, and in all cases there arises the necessity for paring down the rough joints to admit of the perfection of the weapon. Assuming that under like circumstances like ideas are evolved, one would naturally be led to expect to find that somewhat similar ornamental designs would be developed in most of the localities in which these artificially smoothed reed shafts occur.

Although in most of these regions some trace of ornamental adaptation of this paring of the joint obtains, in none have I found the design, developed in this way, so highly modified into a purely conventional pattern as in the Solomon Island series.

In New Guinea the reed shafts of the arrows are mostly trimmed at their joints, and the peeling is frequently very uniform, the lines being of equal length. Generally, the pattern thus formed is blackened, or, more rarely, coloured red, and extends for an inch or more in length. There appears to be but little variety, and the ornament does not seem ever to assume a highly specialised form as in the Solomon Islands.

Some of the Australian fish-spears which I have been able to observe have their joints roughly trimmed, and the lines, some of which are short and others long, picked out in red colour, showing an appreciation of their adaptability to ornamental purposes. In some cases many of the lines extend from one joint to the next. I have noticed, too, that the joints of the shafts of some stone-pointed spears from Port Darwin, have white colour rubbed round them, both above and below the joint; but in this case the colour does not appear to have any definite relation to the peeled lines, and it appears rather to be intended to emphasise the joint or node itself. Here then it is a *natural* peculiarity which has given rise to ornamentation.

Some African javelins with shafts, apparently of some kind of *Calamus*, have the knots scraped smooth both above and below, and blackened by burning, a neat band-like ornamentation being formed. This form of ornament does not appear to be very common. The bamboo shafts of spears from New Hanover are sometimes scraped on *both* sides of the nodes, and a white colour is rubbed over the scraped surface.

Most of the Asiatic reed-shafted arrows have their joints very neatly trimmed, but I have not noticed the development

of any definite pattern from this, unless the decorative bands, which sometimes cover over the nodes in North Indian arrows, have been suggested by the trimming of the joints. In one South American arrow I observed lines running between the joints, blackened, which appeared to take rise from the peeling of the nodes. This is the only instance that has come under my notice, and the use of a hollow reed shaft is comparatively rare, and, when it does occur, the joints are often left rough and untrimmed.

Explanation of Plate VII.

A series of reed shafts of arrows from the Solomon Islands. The figures are numbered in the order of the stages of development of the pattern.

On the OCCURRENCE *of* STONE MORTARS *in the* ANCIENT (PLIOCENE ?) RIVER GRAVELS *of* BUTTE COUNTY, CALIFORNIA.

By SYDNEY B. J. SKERTCHLY, F.G.S., M.A.I.

[WITH PLATE VIII.]

DURING a visit to the Spring Valley Gold Mine at Cherokee, Butte Co., California, my friend Mr. Louis Glass, the Superintendent of the mines, directed my attention to the discovery of stone mortars in the undisturbed gravel of the old river system of California. As this bears upon the question of the antiquity of man in North America the following notes may be interesting. I may add that being away from books references are unobtainable, but I believe Mr. Bowman has examined some of the finds and is satisfied that the mortars occur *in situ*. I am bringing one home with me.[1]

1. *Geological Position.*

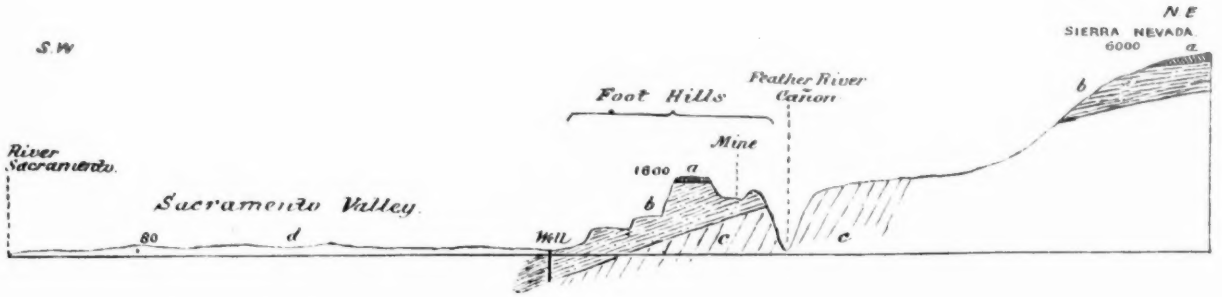
The Spring Valley Mines are situated on the Foot Hills of the Sierra Nevada, in one of the valleys of the Sacramento River system, which are here excavated to a depth of over 2,000 feet.

The following is a section in the deepest part of the channel:

Spring Valley Gold Mine.

1. Basalt cap	25 to 100 feet.
2. White quartz sands with lenticular masses of pipe-clay	450 „

[1] This specimen was exhibited at the meeting.



SKETCH-SECTION FROM THE SACRAMENTO RIVER TO THE SIERRA NEVADA THROUGH SPRING VALLEY GOLD MINE.

Scales.—Horizontal 1 inch = 10 miles.
Vertical 1 inch = 6,000 feet.

Figures = Approximate height in feet above sea level.
d = Alluvium of Sacramento River.
a = Basalt Cap.
b = Gold-bearing Gravels (Old River Channel).
c = Bed Rock. Metamorphosed Cretaceous Slates.

3. Blue gravel, full of decomposed metamorphic or eruptive rock boulders	2 to 15 feet.
4. Blue gravel with large undecomposed boulders, much cemented ..	50 „
5. Bed rock, metamorphosed cretaceous slates.	—

The mortars, of which about 300 have been found since the year 1849, occur in the white sand or gravel No. 2, and one, examined by Mr. Bowman, is said to have occurred in No. 3.

The general relation of the beds is shown in the section in Plate VIII.

The beds 2 to 4 constitute part of one of the old rivers which drained the country prior to the establishment of the present river system. This particular "Cherokee River" cuts across the valley of the Feather River, as shown in the section, and has been proved beneath the Sacramento River at the place marked "well."

The gravel is for the most part well water-worn, even the large boulders, some of which weigh eight tons, being rounded, with the exception of those in bed 4, which are only sub-angular.

I could detect no trace of ice action, and the whole deposit bears evidence of its fluviatile origin. The pebbles and boulders are "shingled," or lie pointing down stream.

At the top of bed No. 3 impressions of leaves are sometimes obtained in a sandy loam very full of black vegetable matter. These have been examined by Prof. L. F. Ward and very doubtfully referred to *Cinnamomum* or *Paliurus*, but he remarks, "The specimen may possibly represent a *Populus* unlike any modern form."[1]

The blue (and more highly auriferous) gravels are sharply distinguished from the overlying white beds, there being often a "pan" of cemented gravel between the two, the cement being red iron oxide. The general opinion is that these blue gravels are of distinct age, and much older than the white. This seems borne out by the characters of the two deposits. The blue gravels contain many very large boulders of metamorphic and eruptive rocks with much black sand (ilmenite), while the white gravels are entirely free from boulders and contain but little black sand.

2. *Age of the Gravels.*

Prof. Whitney considers the white gravels to be of Upper Pliocene age,[2] and that with the blue gravels these auriferous

[1] Diller, "Notes on the Geology of Northern California," "Bull. U.S. Geol. Surv.," 1866, page 16.

[2] "Geol. Surv. Cal.," vol. i, page 211.

deposits may represent the whole of the Tertiary.[1] Dr C. A. White, quoted by Mr. Diller, suspects the whole to be of Upper Pliocene age; and Mr. Diller remarks that "all that can be definitely stated at present concerning the strata containing the leaf impressions is that they are more recent than strata known to belong to the Chico group, and that their flora, as far as Prof. Ward can judge from the few imperfect specimens at hand, has a pre-Pliocene aspect."[2]

These conclusions are based upon the determination of the age of the lava flow which overlies the gravels, and from the age of the faults in the neighbouring Sierras. The lava flows are derived from the vicinity of Lassen's Peak (60 miles north of Cherokee) and are certainly not older than the close of the Pliocene; and as these lavas are faulted the dislocations are probably post-Tertiary. Part of the upheaval of this portion of the Sierras is thus of very recent geological date, and it is quite possible that the ancient river beds may have partaken somewhat in these movements, for I find from observations on the transporting power of the sluices at Cherokee that the present grade of the old channel (about 6 per cent.) could be much reduced and still afford sufficient transporting power to move the larger boulders in the blue gravels.

Whatever be the absolute age of these gravels from a geological standpoint, their immense antiquity historically is beyond question. The present great river system of the Sacramento, Joaquin, and other rivers has been established; cañons 2,000 feet deep have been carved through lava, gravels, and into the bed rock; and the gravels, once the bed of a large river,[3] now cap hills 6,000 feet high. There is ample ground for the belief that these gravels are of Pliocene age, but the presence of objects of human fabrication invests the gravels with a higher interest to the anthropologist than even to the geologist, and may suggest new views.

3. *Occurrence of the Mortars.*

The working face of the mine is an artificial cliff of from 400 to 600 feet in height, the whole of which is fetched down by the water jets of hydraulic giants. The material is washed into the sluices and the mortars are found with the rest of the mass. They are thus not quarried out by hand, but fairly washed out from the gravel. They cannot have come from the surface, for none are ever found there, and many of them have

[1] "Auriferous Gravels," page 283. [2] *Op. cit.*, page 16.
[3] The channel of the white gravels at Cherokee is 1,500 feet.

been seen by Mr. Glass with the original gravel adhering to them. They are readily noticeable as being the only large stones in the white gravel. I may add that the top soil overlying the lava cap is very thin and certainly does not contain these mortars.

Occasionally mortars are found on the surface in the neighbouring gulches, but only where the gulch has intersected the gravels, and these mortars are clearly derived from the old white gravels.

4. *Description of the Mortar.*

The mortar I obtained is composed of some eruptive or metamorphoric rock, which has become so decomposed as not to be easily determinable. Its outside measurements are 9½ inches by 7¼ inches by 6¼ inches, but some specimens are rather larger, others somewhat smaller. The hollow measures 6 inches by 5 inches and is about 5 inches deep. It still retains traces of having been used for grinding. The external shape is irregularly oval and shows distinct traces of chipping. The rock has disintegrated to a light brown colour like many acid rocks, and this and the very rolled character of the utensil gives the appearance of great antiquity.

5. *The Digger Indians.*

This country was inhabited by the Digger Indians until about the year 1865. My friend, Mr. Glass, was well acquainted with them, and assures me that they did not use such mortars: they hollowed out rocks *in situ*, and therein pounded the acorns on which they so largely subsisted. They were acquainted with these mortars, but knew nothing about the makers of them, and held them in such superstitious dread that on no account could they be induced to touch one. This dread of the relics of past ages seems to be everywhere common and is of itself proof of antiquity.

6. *Age of the Gravels.*

If these mortars had not been found in the gravels American geologists would never have doubted their Tertiary age, but when relics of man are demonstrated to exist therein, even in the older blue gravels, one may well hesitate to ascribe to them so great an antiquity.

Even before visiting California I had suspected these old river gravels might be contemporaneous with the glacial epoch, and I still think this possible. This area was not glaciated and these old gravels, hundreds of feet in thickness, may very well represent that great interval of time occupied in other regions by the glacial periods.

This would bring the mortars to approximately the same age as the palæolithic implements discovered by me in East Anglia. It must be admitted that this is only a surmise, but if it be rejected there remains no alternative but to ascribe these relics to Tertiary times.

7. *Conclusions.*

1. These mortars are undoubtedly artificial.
2. They come from the old valley gravels.
3. These gravels are universally believed to be at least as old as Pliocene times.
4. I would suggest they may be of glacial age.
5. The immense antiquity of the gravels is shown—

   (*a.*) By the present river systems being of subsequent date, sometimes cutting through them and the superincumbent lava-cap to a depth of 2,000 feet.

   (*b.*) By the great denudation that has taken place since they were deposited, for they sometimes lie on the summits of mountains 6,000 feet high.

   (*c.*) By the fact that the Sierra Nevada has been partly elevated since their formation.

Explanation of Plate VIII.

Sketch section from the the Sacramento River to the Sierra Nevada, through Spring Valley Gold Mine, showing the geological position in which the stone mortars are found.

Discussion.

Mr. Rudler remarked that in approaching the discussion of this subject it was necessary in the first place to decide whether the object in question which had been described as a mortar, was, or was not, of human workmanship. If proved of human workmanship, it then became needful to enquire whether it really came from the gravel to which it had been referred. And finally, if satisfied on this point, it remained to determine whether the gravel was of the high antiquity which had been suggested.

As to the first question, he believed, after some familiarity with the natural forms assumed by concretions and nodules, that the object which he exhibited to the meeting on behalf of Mr. Skertchly had certainly been fashioned by the hand of man. Although rough, it bore, in the speaker's opinion, indubitable traces of having been artificially wrought. The material seemed to be a trachytic rock, and this had not only been hollowed out with some regard to symmetry but showed on the outside evident marks of chipping.

According to the testimony of Mr. Amos Bowman, formerly attached to the Geological Survey of California, one of these objects was found in an upright position with a pestle in it—an association which would place the original purpose of the hollowed stone beyond all dispute. It may seem strange that mortars are almost the only human relics found in this locality, but they have probably survived by reason of their strength and solidity, while smaller and more fragile articles had perished.

As the mortars are generally found in the gravel after it has been washed down in the course of hydraulic mining, there seems room for some doubt as to the position which they originally occupied.

But Prof. Whitney has cited the evidence of several observers, who testify that they have taken these objects out of undisturbed gravels. There appears no reason to suppose that the mortars had been buried by the Digger Indians, or that they had been accidently washed into the auriferous gravels from superficial deposits: indeed it is believed by eminent authorities who are familiar with the locality that such explanations are indefensible, and that the original position of the mortars in the gravels is beyond all possibility of cavil.

Finally, there remains the question of the age of the gravels. The section in Plate VIII, at once suggests a very high antiquity for these deposits, inasmuch as they are evidently anterior not only to the volcanic activity represented by the outflow of basaltic lava, but also—and this is more important—to the subsequent erosion of the valley by river-action to a depth of several hundred feet. The evidence thus afforded by the physical features of the district is supported and strengthened by the fact that the gold-bearing gravels contain bones of the mastodon and other extinct mammalia. Whether the geological antiquity of these deposits be as high as has been assumed by certain American writers may be a question still open to discussion; and Mr. Skertchly's suggestion that they should be regarded as Glacial rather than as Pliocene will certainly commend itself to those anthropologists who are disposed to exercise a wholesome spirit of caution in dealing with the geological antiquity of man.

Mr. T. V. Holmes thought that if Mr. Skertchly had not been misinformed on any points, and the facts were as described, they had in this case more decisive evidence of the great antiquity of man than he had ever met with before. The section showed what immense changes had taken place in the physical geography of the district since the mortars became imbedded in these ancient river deposits, and these deposits had been covered by the basaltic cap, now largely denuded away. As to the mortars themselves, a single one might possibly be explained away as showing but an accidental likeness to a work of art, but that objection must fall to the ground, if, as stated, about 300 mortars had been found in the same beds.

ANNUAL GENERAL MEETING.

JANUARY 24TH, 1888.

Prof. FLOWER, C.B., F.R.S., *Vice-President, in the Chair.*

The Minutes of the last Anniversary Meeting were read and signed.

The CHAIRMAN declared the ballot open and appointed Mr. T. V. HOLMES and Dr. SUMMERHAYES Scrutineers.

Mr. A. L. LEWIS, the TREASURER, read the following report for the year 1887:—

TREASURER'S REPORT FOR 1887.

The total receipts for the year 1887 have been 646*l.* 3*s.* 1*d.* being 11*l.* 15*s.* 9*d.* less than in 1886, but this amount will probably be more than made up by the value of the subscriptions which have yet to be received, as compared with the value of those outstanding last year. I say the value, because the nominal amount of arrears carried forward is about the same, but some which were brought forward last year and have been proved to be valueless have been struck off during the year, so that those now carried forward are, it is hoped, more valuable, and some have in fact been paid during the present month. The result of an examination of the composition of the receipts is not quite so satisfactory; the subscriptions actually received being 519*l.* 15*s.*, as against 543*l.* 17*s.* in 1886, although four life compositions were received in 1887 as against one in 1886, the nett diminution in annual subscriptions being 63*l.*; some of this apparent difference may, however, be found to be made up hereafter, when all the arrears are settled; it being a disadvantage of a statement of receipts and payments that the transactions belonging to different years get mixed together. The amounts received for interest and sale of publications are a few shillings in excess of those received in 1886, and we have in 1887 an item in our statement, which was not in that of the previous year, in the shape of donations, the President having kindly presented us with the gross amount received for his recent lectures at the South Kensington Museum.

I may mention that three out of the four life compositions received were from old annual members who had previously paid a considerable amount in annual subscriptions.

The payments for the year 1887 have been 634*l.* 14*s.* 9*d.*, being 80*l.* 2*s.* 10*d.* less than in 1886. The items in which an apparent increase occurs are salary and commission, and house expenses, on account of their having been paid up closer to date; while there is a decrease in office expenses, stamps, miscellaneous printing, and in cost of the Journal (principally in the illustrations).

The diminution of expense in this matter has not, however, been due to any false economy on the part of those responsible for the Journal, but to the fact that the papers published have not required many illustrations.

There were 11*l.* 8*s.* 4*d.* more in hand at the end of 1887 than at the beginning of that year.

A. L. Lewis,
Treasurer.

ANTHROPOLOGICAL INSTITUTE OF GREAT BRITAIN AND IRELAND.

Receipts and Payments for the Year ending 31st December, 1887.

RECEIPTS.

	£	s.	d.	£	s.	d.
BALANCES, January 1st, 1887:						
At Bank	114	12	4			
In Office	5	6	10			
				119	19	2
SUBSCRIPTIONS:						
For year 1887	389	11	0			
„ covering 1888	8	8	0			
Four ditto Life Compositions	84	0	0			
Arrears	37	16	0			
				519	15	0
SALE OF PUBLICATIONS:						
Messrs. Trübner & Co.	75	5	8			
Messrs. Longmans & Co.	1	16	4			
Office	7	7	9			
				84	9	9
DIVIDENDS:						
Four quarters on £900 3½ per cent. METROPOLITAN BOARD OF WORKS STOCK				30	10	4

PAYMENTS.

	£	s.	d.	£	s.	d.
RENT, one year to September, 1887				165	0	0
PRINTING:						
Journal, Nos. 56, 57, 58, 59, including illustrations	188	1	11			
Miscellaneous	14	16	9			
				202	18	8
SALARIES AND COLLECTOR'S COMMISSION				172	2	7
STAMPS	31	3	2			
PARCELS	4	2	9			
				35	5	11
ADVERTISING				5	12	1
OFFICE EXPENSES:						
Stationery	7	0	10			
Insurance	1	0	0			
Miscellaneous	2	2	8			
				10	3	6
LIMELIGHT (for Prof. V. Horsley's paper)				2	5	6
HOUSE:						
Cleaning rooms	16	16	6			
Attendance and Refreshments at Meetings	24	10	0			
				41	6	6

DONATIONS:				BALANCES 31st December, 1887:		
Anon	1 0 0			At Bank	116 18 10	
Proceeds of Lectures at South Kensington, on Heredity and Nurture, by the President; presented by him	10 8 0			In hands of Treasurer*	10 8 0	
		11 8 0		,, Secretary (Petty Cash)	4 0 8	
						131 7 6
		£766 2 3				£766 2 3

A. L. LEWIS, *Treasurer.*

Examined and found correct,

(Signed) EDWARD W. BRABROOK. } *Auditors.*
J. E. KILLICK, }

20th January, 1888.

* Received too late to pay into Bank on 31st December.

Mr. F. W. RUDLER, the Secretary, then read the following Report:—

REPORT OF THE COUNCIL OF THE ANTHROPOLOGICAL INSTITUTE OF GREAT BRITAIN AND IRELAND FOR THE YEAR 1887.

During the past year the Institute has held thirteen ordinary meetings, in addition to the Annual General Meeting.

The following list gives the titles of the papers and other communications which have been brought before the Institute during the year:—

1. "Notes on the Tribes of the Nile Valley North of Khartum." By Lieutenant-Colonel Sir Charles Wilson, R.E., K.C.B.
2. "The Functional Topography of the Brain." By Professor Ferrier, F.R.S.
3. "Description of the Cerebral Hemispheres of an Adult Australian Male." By H. D. Rolleston, Esq., B.A.
4. "On a Fossil Human Skull from Lagoa Santa, Brazil." By Sören Hansen, Esq.
5. "Stone Circles near Aberdeen." By A. L. Lewis, Esq., F.C.A.
6. "Palæolithic Implements from the Drift Gravels of the Singrauli Basin, South Mirzapore." By J. Cockburn, Esq.
7. "Stone Implements from Perak." By Abraham Hale, Esq.
8. "On the Migrations of the Eskimo." By Dr. H. Rink.
9. "Notes on the Inhabitants of the Polynesian Islands." By Coutts Trotter, Esq.
10. "Exhibition of Aborigines from North Queensland." By Mr. R. A. Cunningham.
11. "On the Ethnological bearings of the Stone Spinning-top of New Guinea." By Mr. C. H. Read, F.S.A.
12. "Extracts from Notes on Natives of the Solomon Islands." Communicated by Lieutenant F. Elton, R.N.
13. "On the Operation of Trephining during the Neolithic Period in Europe; and on the probable method and object of its performance." By Professor Victor Horsley, F.R.S.
14. "Comparison between the Recuperative Bodily Power of Man in Rude and in Highly Civilised Life." By George Harley, Esq., M.D., F.R.S.
15. "On the Evidence for Mr. McLennan's Theory of the Primitive Human Horde." By G. L. Gomme, Esq.
16. "On the Dieyerie Tribe of South Australia." By Samuel Gason, Esq. Communicated, with Notes, by J. G. Frazer, Esq., M.A.
17. "Exhibition of 'Hag-stones' from Kincardineshire, with Notes." By the Right Hon. the Earl of Ducie.
18. "Exhibition of Guancho Skulls, with Notes." By Henry Wallach, Esq.
19. "Hittite Ethnology." By Captain C. R. Conder, R.E.
20. "On an Ancient British Settlement excavated near Rushmore, Salisbury." By Lieutenant-General Pitt-Rivers, F.R.S.
21. "On the Stature of the Older Races of England, as estimated from the Long Bones." By John Beddoe, Esq., M.D., F.R.S.
22. Exhibition of Implements and Works of Art from the Lower Congo. By Major-General Sir Frederic Goldsmid, K.C.S.I., and by Delmar Morgan, Esq.
23. "The Lower Congo; a Sociological Study." By R. C. Phillips, Esq.
24. "The Primitive Seat of the Aryans." By the Rev. Canon Isaac Taylor, LL.D., Litt.D.
25. "The Maori and the Moa." By Edward Tregear, Esq.
26. "The Shell Money of New Britain." By the Rev. Benjamin Danks.

27. "On the Evolution of a Characteristic Pattern on the Shafts of Arrows from the Solomon Islands." By Henry Balfour, Esq., M.A.
28. "Tattooing." By Miss A. W. Buckland.
29. "On the occurrence of Stone Mortars in the Ancient (Pliocene?) River Gravels of Butte County, California." By Sydney B. J. Skertchly, Esq., F.G.S.

In addition to the work represented by this list of papers a course of three lectures on "Heredity and Nurture" has been delivered by the President in the theatre of the South Kensington Museum. These lectures were attended by large and appreciative audiences, and at the close of each lecture the use of the simpler kinds of anthropometric instruments was explained and illustrated.

The Institute is indebted to the Lords of Committee of Council on Education for granting the free use of the theatre for this purpose.

The four numbers of the *Journal*, published with punctuality during the year, viz., Nos. 58, 59, 60, and 61, contain 386 pages of letterpress with 10 plates of illustrations.

During the past year 9 new members have been elected, while the Institute has lost, through death, 11 ordinary members, 3 honorary members and 1 corresponding member.

Thirty-seven members have either retired or been removed from the list in consequence of their subscriptions having been long in arrear, the Council having thought it desirable to subject the list to a searching revision, and to remove the names of those whose subscriptions had been long unpaid. Three old annually subscribing members have compounded during the year.

The former and present state of the Institute, with regard to the number of members, are shown in the following table:—

	Honorary.	Corresponding.	Compounders.	Ordinary.	Total.
January 1st, 1887	47	77	87	282	493
Since elected ..	..	..	+4	+8	+12
Since deceased ..	−3	−1	..	−11	−15
Since retired or struck off ..	..	−1	..	−40	−41
January 1st, 1888	44	75	91	239	449

The Council regrets to report the decease of the following Members:—*Honorary Members*—Prof. A. Ecker, Prof. A. F. Pott, Dr. C. Rau; *Corresponding Member*—Sir Julius von

Haast; *Ordinary Members*—Lady Brassey, Mr. H. Crowley, Mr. J. O. Griffits, Sir W. Vernon Guise, Bart., Mr. G. Hawkins, Mr. J. E. Lee, Mr. Hugh Brooke Low, Mr. Karl F. Nordmann, Mr. F. E. Robinson, Mrs. Erminie E. Smith, and Mr. Hodder M. Westropp.

The Council has to report that it has undertaken, at the request of the British Association Committee, the preparation of a new edition of the volume of "Anthropological Notes and Queries," in consequence of the receipt of the following letter from the Secretary of the Association Committee, which was submitted to the Council at their meeting on October 25th:—

DEAR SIR,

The Committee of the British Association, consisting of General Pitt-Rivers, Dr. Beddoe, Prof. Flower, Mr. Francis Galton, Dr. E. B. Tylor, and Dr. Garson, appointed for the purpose of re-editing a new edition of "Anthropological Notes and Queries," with authority to distribute gratuitously the unsold copies of the present edition, having been re-appointed, desire to give effect to the following proposal in their report of the past year to the British Association:—

> "The Committee, after carefully considering the question of how the preparation of the new edition can be most efficiently done, strongly recommend that the work be entrusted to the Anthropological Institute of Great Britain and Ireland; that body being specially and permanently organised for the purpose of advancing the various branches of anthropology; and having many facilities not possessed by a committee, such as a Council which meets regularly and at short intervals during the greater part of the year, is peculiarly well fitted to carry out the necessary arrangements for a thorough revision of the work, and of afterwards bringing it under the notice of those for whom it is intended. The Committee has reason to believe that the Anthropological Institute would be willing to undertake the task and to proceed with the work during the ensuing winter."

They, therefore, ask the Council of the Anthropological Institute whether they are willing to undertake the editing of the new edition of "Anthropological Notes and Queries."

The sum of 50*l.* has been placed at their disposal, which they would hand over to the Council of the Institute if they accept the task, as well as a supplementary sum of 10*l.* contributed as an additional subsidy by Dr. Muirhead.

I am, yours truly,
(Signed) J. G. GARSON,
Secretary of the Committee.

The President of the Anthropological
Institute of Great Britain and Ireland.

After the reading and discussion of this letter it was resolved on the motion of Mr. Brabrook, seconded by Mr. Atkinson, "That the Council comply with the request of the Committee."

The Council has entered on the work thus entrusted to its care, and a working Committee is at present occupied with the subject.

As the outcome of a discussion on the paper read before the Institute some time ago by Mr. Reginald Stuart Poole, a Committee of the British Association was appointed at Birmingham in 1886, for the purpose of procuring ethnological photographs, &c., from the Egyptian monuments, and it was afterwards arranged that a set of these should be presented to the Institute. Mr. Flinders Petrie very ably carried out this work, and brought home last year a valuable collection of paper squeezes from which excellent plaster casts have been prepared. Some of these were exhibited at the Manchester meeting of the British Association, and subsequently at the South Kensington Museum. It is believed that the collection will find a final resting place in one of our national Museums.[1]

It may be mentioned that the interests of anthropology were well cared for at the last meeting of the British Association. Not only did the Anthropological Section, under Prof. Sayce, with Dr. Garson and Mr. Bloxam as Secretaries, have a successful meeting, but an anthropological laboratory was open daily in connection with this section, at which between two and three hundred individuals were measured.

Among the events of the year bearing upon the work of the Institute mention may be made of the issue of the volume by General Pitt-Rivers, describing his recent extensive excavations near Rushmore. This largely illustrated volume has been privately printed by the author, but has been generously distributed to those who are interested in the archæological branches of anthropological science.

On the motion of Mr. S. E. BOUVERIE-PUSEY, seconded by the Rev. E. S. DEWICK, the Reports of the Treasurer and the Council were adopted.

The following address by the President was then read:—

[1] Members of the Institute may be glad to know that photographs of these casts may be obtained at the mere cost of printing copies, from Mr. Browning Hogg, of High Street, Bromley.

ADDRESS *delivered at the* ANNIVERSARY MEETING *of the* ANTHROPOLOGICAL INSTITUTE *of* GREAT BRITAIN *and* IRELAND *January 24th*, 1888.

By FRANCIS GALTON, F.R.S., *President.*

ON behalf of this Institute, and sanctioned by their Council, I had the honour of delivering a short course of Lectures in December last, on *Heredity and Nurture*, at the South Kensington Museum. Their object was to test the reality of a supposed demand for information on such subjects, and so far as it was possible to judge from the results, there seemed to be a widely spread interest in the matter. It gives me pleasure to express my obligations to the Lords Commissioners of Education for the free use of their theatre, and to the many officers at South Kensington who aided in the various arrangements. Major Abney and General Festing exhibited in action their beautiful apparatus for testing the colour sense, which was described in the Bakerian Lecture before the Royal Society last year, and at the conclusion of each lecture Dr. Garson, Mr. Rudler, and Mr. Bloxam explained the working of the anthropometric instruments that were laid on side tables. Whether it be feasible for this Society hereafter to promote other lectures bearing on special topics in Heredity and Nurture, is a question on which I do not feel competent as yet to form an opinion, though I have no doubt that hopeful attempts to enlist popular interest in any branch of anthropology will always meet with your approval.

These lectures have led to at least one tangible result. I took the opportunity to reiterate my often expressed regret that no anthropometric laboratory existed in this country, at which children and adults of both sexes could at small cost have their faculties measured by the best methods known to science, and a record kept for their future use. I explained how difficult it would be to maintain such a laboratory, and to make it effective except under the shelter of some important institution, that

was daily frequented by the class of persons likely to make use of it. Previously, I had applied for permission to erect such a laboratory at the South Kensington Museum, but the difficulties of a suitable position seemed insuperable. Thanks, however, to a recent suggestion of General Donnelly, and with his cordial aid, and also with that of General Festing, a successful application was made to Her Majesty's Commissioners of 1851 for a small portion of the Arcades, rent free, that adjoins the Western Galleries at South Kensington, containing the collection of scientific instruments, wherein to erect a wooden building for the laboratory. It will be connected with and have its only entrance from the gallery. The building has (at the time when I revise these pages) been completed under the obliging superintendence of General Festing, and is opened to the public, though as yet incompletely equipped. I append in a foot note a copy of the printed notice.[1] In one sense it is small, but it offers sufficient accommodation for the purpose immediately in view, which is little more than a development on

[1] Anthropometric laboratory for the measurement in various ways of human form and faculty. Entered from the Western Galleries containing the Science Collection of the South Kensington Museum.

This laboratory is established by Mr. Francis Galton for the following purposes:—

1. For the use of those who desire to be accurately measured in many ways, either to obtain timely warning of remediable faults in development, or to learn their powers.

2. For keeping a methodical register of the principal measurements of each person, of which he may at any future time obtain a copy under reasonable restrictions. His initials and date of birth will be entered in the register, but not his name. The names are indexed in a separate book.

3. For supplying information on the methods, practice, and uses of human measurement.

4. For anthropometric experiment and research, and for obtaining data for statistical discussion.

Charges for making the principal measurements:—Three pence each, to those who are already on the Register. Fourpence each, to those who are not:—One page of the Register will thenceforward be assigned to them, and a few extra measurements will be made, chiefly for future identification.

The Superintendent is charged with the control of the laboratory and with determining in each case, which, if any, of the extra measurements may be made, and under what conditions.

a more permanent basis of the anthropometric laboratory that I established in the International Health Exhibition of 1884, and at which nearly 10,000 persons were measured. I propose now to preserve copies of the records in such a form that the persons measured may always be able to refer to them so long as the laboratory exists. There will be one page of a folio register book assigned to each person in which the measurements made on successive occasions will be copied on successive lines, to show at a glance the personal development. No names will appear in the registers, but only initials and dates of birth; the names and the mothers' surnames will be entered in a separate book. There will be besides a brief list of questions, both personal and family, which the applicant for measurement will be invited to answer, one of them is whether the parents were first cousins. The copies of the measurements retained in the laboratory will be useful in two ways, the one as statistical documents, and the other as records always accessible under proper restrictions to the persons measured, or to their representatives. I conceive that this arrangement will facilitate the desirable, practice of keeping family records, because so far as members of any family may have been measured, it will be feasible, with their concurrence, to obtain copies of those measurements. I am by no means one of those who desire to confine anthropometry to the simpler physical data, but I wish to extend it as widely as the possibilities of measurements, however rough, may allow. Under judicious statistical treatment, rough measurements of many individuals are capable, as we all know, of yielding trustworthy results, and if we ascertain the degree of precision of our measurements, we can treat them individually on scientific principles, assigning to them their just weight, however small their precision may be. The off-hand measurements that can alone be made of a person who is only a few minutes under experiment, in respect to the delicacy of his senses, and of his reaction-times, are far better than none at all. They will at least serve to indicate such marked peculiarities as may merit more sustained examination.

The conditions of the laboratory admit only of measurements of the living person and in clothes, and we must make the best of these conditions. It would be undesirable to ask even that the shoes should be taken off. When persons of all ranks and of both sexes are admitted, and many operations have to be gone through in a brief time, it is necessary to measure those persons in their usual indoor clothing. Quite enough can be done under this restriction to furnish a record of the rate of growth and development of the young, and to yield statistical data of considerable value. We can at least record the eye colour; the length, breadth, and possibly the height of head; the stature in shoes less the thickness of the heel, the height above chair when sitting squarely in it, and the height of the knee above the ground; also the spread of the arms from finger tip to finger tip, the length of the middle finger, which is correlated with the length of the foot, and that from finger tip to elbow. These measurements give directly or inferentially the total stature and total arm-spread, and the respective lengths of the trunk and the two leg-bones; also the lengths of the upper and lower arm and of the middle finger. We also can easily and rapidly obtain the lung capacity, strength of squeeze with the right and left hand, keenness of sight with right and left eye, and the colour sense. More delicate apparatus will be at hand to be used occasionally, to test the remaining senses, the psycho-physical reactions, and such other physiological constants as may be found feasible and convenient to measure.

The curious memoir by M. Alphonse Bertillon in the "Annales de Démographie Internationale," republished as a pamphlet in 1881,[1] and the memoirs read at the International Penitentiary Congress at Rome in 1885,[2] by that gentlemen and by M. Louis Herbette, Director of the Penitentiary Department of the Interior,

[1] Une application pratique de l'anthropométrie sur un procédé d'identification, permettant de retrouver le nom d'un récidiviste au moyen de son seul signalement, &c. (G. Masson, Paris, 1881).

[2] "Les Signalements Anthropometriques." Conférence faite au Congrès Pénitentiare International de Rome (G. Masson, Paris, 1886).

and the very favourable remarks on M. Bertillon's methods by M. Paul Topinard, in the "Revue d'Anthropologie," of 1886, p. 607, and of 1887, p. 379,[1] suggest another use for an anthropometric laboratory. M. Bertillon showed that the various measurements of an individual might afford data of extraordinary value in deciding questions of identity. Ten or a dozen words easily transmissible by telegraph, could give a sufficiently exact description of a man to make it highly improbable that the same words would apply to any other out of many thousands of persons. The immediate object of M. Bertillon's method was to afford means of discovering whether an arrested person had been previously convicted. It is impossible for the French police to make effective search through the vast collection of photographs in their keeping, which is stated to have received an accession of 100,000 in number during the course of 10 years. He, therefore, suggested the plan of indexing prisoners according to their measurements, and this appears to be now done with considerable success. The service over which he presides is well installed and is in full work. The measurements chiefly relied upon were adopted after considerable preliminary experience and consideration in concert with M. Topinard, who speaks of M. Bertillon's method in the first of the passages above referred to, as "an ingenious system which experience has proved to be excellent, which I have seen in work, and have myself practised, and which I declare to answer its purpose perfectly." Independently of this application of anthropometry to rogues, it is clear that it may also be of service to honest men; I cannot do better than extract some phrases from M. Herbette's speech, as published in the French report of the Penitentiary Congress at Rome, already alluded to.

"S'élevant à des considérations d'ordre plus général encore et louant les heureux efforts de M. Bertillon, M. Herbette a montré comment cette constatation de la personnalité physique et de l'indéniable identité des individus arrivés à l'âge d'adulte,

[1] "Une visite à la Préfecture de Police au bureau des signalements anthropométriques" de M. Alphonse Bertillon.

doit répondre, dans la société moderne, aux besoins les plus réels, aux services les plus variés.

" Qu'il s'agisse de donner par exemple aux habitants d'une contrée, aux soldats d'une armée, aux voyageurs allant dans les pays les plus lointains, des notices ou cartes individuelles, des signes recognitifs permettant de déterminer et de prouver toujours quels ils sont ; qu'il s'agisse de compléter par des indications certaines les actes de l'état civil, d'empêcher toute erreur et toute substitution de personnes ; qu'il s'agisse de consigner ces marques distinctives de l'individu dans les documents, titres, contrats, où sa personnalité doit être établie pour son intérêt, pour l'intérêt des tiers ou pour l'intérêt de l'État, le mode de signalement anthropométrique peut trouver sa place.

" Qu'il y ait certificat de vie, contrat d'assurance sur la vie ou parfois acte de décès à dresser, qu'il y ait à trouver, à certifier l'identité d'une personne aliénée ou grièvement blessée, ou défigurée, dont le corps aura été en partie détruit, ou sera devenu méconnaissable ou sera difficile à reconnaître, en cas de mort subite ou violente, à la suite d'un crime, d'un accident, d'un naufrage, d'un combat,—quelle ne sera pas l'utilité de tracer ces caractères invariables en chaque individu, infiniment variables d'un individu à l'autre, indélébiles au moins en partie, jusque dans la mort ?

" A plus forte raison aurait-on à s'en préoccuper s'il fallait faire reconnaître les gens à longue distance et à une longue durée d'intervalle, après que l'apparence extérieure, la physionomie, les traits et les habitudes physiques ont pu se modifier de façon naturelle ou artificielle, et cela sans déplacement ni frais, par simple échange de quelques notes ou chiffres à envoyer d'un pays à l'autre, d'un continent à l'autre, de manière à savoir aux États-Unis ce qu'est tel homme venu de France, et à établir si tel voyageur que l'on trouve à Rome est bien tel personnage qu'on a mesuré à Stockholm dix ans auparavant.

" En un mot, fixer la personnalité humaine, donner à chaque,

être humain une identité, une individualité certaine, durable, invariable, toujours reconnaissable, et facilement démontrable, tel semble l'objet le plus large de la méthode nouvelle.

"On peut dire en conséquence que la portée du problème comme l'importance de la solution dépasse de beaucomp les limites de l'œuvre pénitentiaire et l'intérêt pourtant bien considérable de l'action pénale à exercer dans les diverses nations."

Whether all that was claimed for the power of M. Bertillon's system, on purely theoretical grounds and in his earlier publications can be sustained, may fairly be questioned; but there can be no doubt that a series of measurements must be of considerable service as supplementary evidence, either that a person is really the man he professes to be, or negatively that he is not the man for whom he is taken. In speaking of these matters it is impossible not to allude to the Tichborne trial, and the enormous waste of money, effort, and anxiety which might have been spared, had Roger Tichborne passed through an anthropometric laboratory before he went abroad. It would be a reasonable precaution for every person about to leave his country for a long time, having regard to the various accidents of good or ill-fortune, to be properly measured, and to leave a copy of his measurements in the safe keeping of an anthropometric laboratory.

It will doubtless be of interest to many if I should give here the principal details of M. Bertillon's system such as I have learnt partly from published memoirs, and partly from the obliging answers accompanied by useful illustrations that I have received from that gentleman in answer to my inquiries.

All the measurements and other remarks concerning each person are written opposite to printed headings, upon a thick card $5\frac{1}{2}$ inches square. The most convenient primary basis for classifying the cards is found to be not stature, but the head-length and the head-breadth, and in each case under the three-fold division of large, medium, and small. The limiting values of the measurements ranked as medium are so chosen that the number of large, medium, and small measurements shall be

approximately equal. We thus obtain nine primary classes. Each of these is sub-divided according to a secondary classification of foot-lengths and of the middle finger-lengths of the left foot and left middle finger respectively, and as before under the threefold division of large, medium, and small. Thus there are nine secondary sub-divisions of each of the nine primary classes; that is eighty-one sub-divisions in all, to each of which is allotted a separate compartment in a large cabinet. Each of the cards is sorted into its appropriate compartment. The number of persons at present dealt with is such that there are an average of five hundred cards in each compartment. In each of the eighty-one compartments the cards are again sub-divided into nine tertiary groups by means of attached tickets, that project beyond the upper margin of the cards. They are of three different colours, according to whether the man is of large, medium, or small stature, and they are cut into different shapes, something on the plan of an A B C index, according to whether the person measured has a long, medium, or short arm, reckoning from the elbow to the middle finger tip of the left arm. Thus there are nine times eighty-one, or seven hundred and twenty-nine tertiary groups. There still remains the possibility of further sub-division on the same general principle.

It is found to be a rapid operation to scrutinise individually the small batch of cards to which this process of six successive sub-divisions, each with three categories, directs the search. It is also found that the cases are not so numerous as might be feared in which the nearness of the measurement to limiting values, makes it necessary to extend the search to many compartments, but on this point precise details are as yet wanting. There is also an absence of data from which the frequency of such cases might be theoretically inferred.

It appears to me that the problem of the easiest method of identification by measurements might be usefully furthered, if certain data existed which could be procured with little difficulty. Let us consider what it is with which we have to deal. It is the comparison of two fallible measures of a variable

subject. The man who measures the subject in the first instance, is liable to error; the subject in the course of months or years is liable to vary; again, the second operator who measures him at the end of the period is liable to error. The data which we want for calculation are the "probable errors" of the two operators, whose compound effect could easily be formulated if they measured, say, a couple of hundred persons consecutively and independently. If there were three operators, A, B, and C, the series of differences between the measurements by A and B, by A and C, and by B and C, would enable us to easily disentangle the probable errors of each. Again we want more definite information than we as yet possess about the variability of the subject, after different intervals of time, and at different ages.

Another, and a very important question, is as to the degree in which the several bodily proportions that are measured may be looked upon as independent variables. The stature is related with the length of the foot, and with that of forearm, and we should expect a still closer relation to exist between any two of these taken together, and the third. We have yet to learn the proportion between the number of the elements measured, and their value for purposes of identification. The supposition that they may be treated as independent variables, which lies at the bottom of some of the earlier estimates, such as that in page 22 of the Conference at Rome, headed "Étendue infinie de la Classification," cannot be accepted as correct.

The whole subject of "Personal Identification and Description" forms an important chapter of anthropological research, and it is one on which I hope before long to be in a position to offer some views of my own.

It was moved by Mr. HYDE CLARKE, seconded by Dr. GARSON, and unanimously resolved:—

> "That the thanks of the meeting be given to the President for his Address, and that it be printed in the Journal of the Institute."

The Scrutineers gave in their Report and the following gentlemen were declared to be duly elected to serve as Officers and Council for the year 1888 :—

President.—Francis Galton, Esq., M.A., F.R.S.

Vice-Presidents.—J. G. Garson, Esq., M.D.; Prof. A. H. Keane, B.A.; F. G. H. Price, Esq., F.S.A.

Secretary.—F. W. Rudler, Esq., F.G.S.

Treasurer.—A. L. Lewis, Esq., F.C.A.

Council.—G. M. Atkinson, Esq.; E. W. Brabrook, Esq., F.S.A.; C. H. E. Carmichael, Esq., M.A.; Hyde Clarke, Esq.; A. W. Franks, Esq., M.A., F.R.S.; Lieut.-Col. H. H. Godwin-Austen, F.R.S.; T. V. Holmes, Esq., F.G.S.; H. H. Howorth, Esq., M.P., F.S.A.; Prof. A. Macalister, F.R.S.; R. Biddulph Martin, Esq.; Prof. Meldola, F.R.S.; Right Hon. the Earl of Northesk, F.S.A.; C. Peek, Esq., M.A.; Charles H. Read, Esq., F.S.A.; Lord Arthur Russell; Prof. A. H. Sayce, M.A.; H. Seebohm, Esq., F.L.S.; Oldfield Thomas, Esq., F.Z.S.; M. J. Walhouse, Esq., F.R.A.S.; General Sir C. P. Beauchamp Walker, K.C.B.

A vote of thanks to the Treasurer and Secretary for their services during the past year was moved by Mr. G. W. ATKINSON, seconded by Dr. SUMMERHAYES, supported by the Rev. H. H. WINWOOD, and carried unanimously.

Mr. A. L. LEWIS moved and Dr. GARSON seconded, a vote of thanks to the retiring Vice-President, the retiring Councillors, the Auditors, and the Scrutineers, which was carried by acclamation.

ANTHROPOLOGICAL MISCELLANEA.

The PRIMITIVE HUMAN HORDE.

I do not think there is much to answer in Mr. Wake's note. His position seems to me insupportable because (1) He takes pains to discuss matters which I do not dispute; (2) He assumes conclusions on my behalf which I do not admit; and (3) He does not appear to accept the doctrine of survival in custom.

(1.) The difference between Mr. McLennan's conception of the horde and mine is fully recognised and emphasized by me. Mr. Wake's observations on the same point are, therefore, superfluous. But because I differ from Mr. McLennan as to the organisation and construction of the horde, does it follow that I supply no evidence in support of Mr. McLennan's theory of the existence of the primitive group or horde? It was no part of Mr. McLennan's task to work out the details of the horde organisation; what he did was to arrive at the "conception" of such an organisation by working back through later stages of society until he came to the horde. Accepting Mr. McLennan's general conclusion, I sought to fill up the outline with some special researches.

(2.) Mr. Wake's method of argument is curious. On p. 279 he "assumes" that the totem organisation of the horde was based upon the same ideas as the gens. This assumption, in the following paragraph, becomes an "important conclusion," from which he is enabled to state that "the totem organisation in the primitive horde would thus require it to have been bound together by the ties of kin," and finally to conclude that totemism and exogamy imply the existence of kinship by blood. I cannot follow the steps in the logic of this singular paragraph; I dispute the "assumption," the "important conclusions," and most of all the final conclusions, and I await Mr. Wake's proofs.

(3.) Mr. Wake considers that, because the Abor tribes have developed some agricultural and other advanced habits, therefore the particular qualities quoted by me are not evidence of "horde" organisation. May I ask him whether he cannot conceive the Abors to have retained some very primitive characteristics during the time they were advancing? He would admit it in the case of the Welsh who retained bride-capture in historical times.

I quite admit that the evidence wants careful weighing, and I thank Mr. Wake for his observations on the tribes I have mentioned. On the question of the Andaman Islanders Mr. Wake pins his faith to Mr. Man's observation. I agree with Mr.

Featherman's criticisms of Mr. Man; but on this point I can understand Mr. Wake's criticism. But I altogether object to his "assuming" something on my behalf and then demolishing me on the strength of this assumption. Thus, on p. 279, Mr. Wake says the Arab tribe "*may be said* to answer as nearly as possible to Mr. Gomme's horde," and then goes on to disprove the likeness and to speak of "unfortunately for his (*i.e.* Mr. Gomme's) hypothesis." Now I never considered, and do not consider, the Arabs have anything to do with the horde type of society, and I have expressly disclaimed the notion that any modern people could be taken, as a whole, to represent the primitive human horde.

G. Laurence Gomme.

Barnes Common.

Statistics *bearing upon the* Average *and* Typical Student *in* Amherst College, March, 1888.

By Dr. E. Hitchcock, assisted by Dr. H. H. Seelye.

The three columns of figures on the next page are the results of an attempt to learn what are the measures and proportions of *the average student, and the student of mean proportions* in Amherst College as derived from the anthropometric data gathered in the Department of Physical Education and Hygiene.

The first column gives the *averages*—in the several different items—*of all the students* who have been connected with College from 1861–2 up to 1887–8 inclusive.

The second column gives the *averages* of the same items of those students only who were of *the average height of all College*—those whose height was 1,725 millimetres, or 67·9 inches.

The third column is made up in this manner:—Each item is separated into numerical groups—or columns of figures—of a small range—of a few millimetres each, and arranged side by side on a horizontal line, so as to show the relative size of each one to the other, or of the largest to those of middle proportions, and of each of these to the smallest, the top of the columns representing an ascent and descent.

This will give a gradually ascending series from the left or smallest individuals to about the centre of the groups, where the columns will grow shorter and shorter to the right, or to the largest individuals. The central column, or the point between the two columns—if they chance to be two columns of equal numbers—will give *the mean or typical measurement of the item.*

In the item of *Height* for example, we may divide it into groups of 10 millimetres, or about half an inch each, beginning with 1,600 to 1,610 millimetres or 63 inches, and running to 1,830 millimetres, or 72 inches. This will give us 25 groups in all—and each man's height as preserved in the book of records will have been placed in the proper groups.

When all are gathered together in this manner we have an ascending series from the lowest or smallest measure to a certain point where the series begins to descend to the highest or largest measure. This point—or recorded height—where the greatest number of observations are found, constitutes the "mean" or the central point of all the heights, and is to be regarded as the typical or standard height of all the students. Hence this third column indicates the *student of mean Proportions*, while the other columns indicate the relations of the *Average Student.*

Average and mean anthropometric data of Amherst College Students, March, 1888:—

	Items of Observation.	The average Amherst Student.	The Amherst Student of average Height.	The Amherst Student of "mean" Proportions.
	Weight ... ... *Kilos.*	61·2	61·7	61·5
Heights.	Body ... *Millimetres.*	1725	1725	1720
	Sternum ,,	1410	1408	1410
	Navel ... ,,	1030	1050	1030
	Pubes ... ,,	860	862	860
	Knee ... ,,	476	475	478
	Sitting... ,,	903	902	904
Girths.	Head ... ,,	572	572	568
	Neck ... ,,	349	353	350
	Chest Repose ,,	880	887	890
	Chest Full ,,	927	928	930
	Belly ... ,,	724	724	730
	Hips ... ,,	900	891	900
	Thighs ,,	515	518	515
	Knees ... ,,	355	357	355
	Calves ,,	345	348	345
	Insteps ,,	241	240	240
	R. U. Arm Cont. ,,	295	294	295
	Upper Arms ,,	257	258	255
	Elbows ,,	249	250	248
	Forearms ,,	260	260	262
	Wrists... ,,	161	165	160
Breadths.	Head ... *Millimetres.*	155	153	154
	Neck ... ,,	108	108	109
	Shoulder ,,	430	432	425
	Waist ... ,,	250	254	250
	Hips ... ,,	323	323	325
	Nipples ,,	198	197	200
Lengths.	ShoulderElbows ,,	372	372	370
	Elbow Tips ,,	458	462	460
	Feet ... ,,	260	262	255
	Stretch of Arms ,,	1780	1785	1781
	Horizn. Lengths ,,	1732	1730	1728
Strengths.	Lungs ... *Kilos.*	1·5	1·3	1·5
	Back ... ,,	137	138	135
	Legs ... ,,	166	164	160
	Forearms ,,	39	38	37
	Total ... ,,	454	456	450
	Dip *No. of times.*	6	6	6
	Pull Up ... ,,	9	10	10
	Lung Capacity, *Litres.*	4·11	4·19	4·27
	Pilosity, *Part of the body.*	2·25	2·10	2·25

These are "Metric" measurements, and where the item is taken double—right and left parts—the average of the two is the record.

Distribution *of* Indian Tribes *in* North America.

The United States Geological Survey has nearly ready for publication a map showing the distribution of the Indian tribes on this continent north of Mexico. Including the labour which Major Powell himself and his immediate assistants have expended in the collection, arrangement, and digestion of the material for this map, and that done by the Bureau of Ethnology, it will represent the work of about fifteen years, and will be one of the most

important and interesting publications ever made by the Geological Survey. All of the Indians living in this country at the time of the white occupation have been divided into linguistic families, and the territory occupied by each one of these families is represented on the map by a distinctive colour. The number of these families is about 60, and the number of separate tribes between 300 and 350.

One of the first and most important facts shown by this map is that the territory occupied by each linguistic family, with few exceptions, is continuous. An important deduction in relation to the habits of the Indians is drawn from this fact,—that instead of being nomadic, and wandering over the continent at will, as has been generally supposed, the Indians had fixed homes, the boundaries of which were almost as plainly marked as the dividing lines between the several States are to-day, and that their wanderings were within limited areas, rarely or never extending beyond these fixed boundaries. The Indians had their permanent villages, in which they lived for five, ten, twenty, or perhaps fifty years. At certain seasons of the year they went to the coast or to the rivers to fish, or to the forest or plains to hunt. The boundaries of the territories occupied by each family were occasionally changed by conquest. A stronger tribe or family would by war push back its weaker neighbours, and thus extend its dominion. But the territory so conquered was recognised by the vanquished, as well as by the victor, as the property of the latter. If the Indians had been nomadic, and wandered over the continent, or over large portions of it, branches of the same linguistic family would have been found scattered broadcast all over the country.

Some of the few exceptions to this general rule of distribution are exceedingly interesting, and throw a light upon the unwritten and even forgotten history of some of the tribes. For instance: a little colony of the great Siouan family is found in Virginia. How it became separated, crossed the mountains, and maintained itself in the midst of another family speaking an entirely different language, suggests a very interesting topic for the study of the ethnologist. Again: all the north-western part of the continent was occupied by the Athabascan family, very peaceable Indians. But the Apaches and Navajos of New Mexico and Arizona belong to the same family, and are among the most warlike on the continent. To their surroundings and the necessity of wresting their new home from its previous occupants and holding it, as well as to the inhospitable character of the country, may not their change of character be attributed? Another little tribe of the Athabascans is found in California.

One of the most degraded families of Indians of North America in the Shoshonean, of which the Diggers are a branch. And yet, strange as it may appear, the Moquis, more advanced toward civilisation than any others of the Pueblo Indians, are Shoshonean.

One exceedingly interesting feature of the map is the great number of little families that lived in California and Oregon. Some

of these comprise only a few individuals—not more than forty or fifty—and yet their languages are entirely distinct from those spoken by the surrounding tribes. In one instance Mr. Henshaw, who has charge of the construction of the map, found in California a single man, the sole survivor of his tribe. From him enough was learned to preserve the language once spoken by his ancestors, but with his death that tongue becomes extinct.

A very curious fact in relation to the distribution of the Eskimo is that they inhabit the coast of the Arctic regions to the exclusion of other Indians, beginning on the east shore of Greenland, and following the coast-line of that island around to the point farthest north inhabited by man. Then, beginning on the coast on the mainland, they occupy narrow strips on the north shore of Hudson Bay and along the northern coast of the continent, around past Behring Strait, and down the north-west coast of the continent to Prince William's Sound. Throughout all this immense coast-line the differentiation of language is very small; so that an Eskimo from Greenland transported to Behring Strait would in a month be able to speak the language of the natives there as well as though he had been born there. In striking contrast were the numerous distinct families of Indians in the valleys of California and Oregon, whose languages are so different that they could not understand each other.

This map, when published, will be accompanied by a report and discussion of the facts it discloses, and will be a very important contribution to the science of ethnology.—*Science*, March 23rd, 1888, p. 139.

The late Mr. McLennan.—A posthumous paper by Mr. J. F. McLennan containing a brief outline of his latest, and as yet unpublished, views of the Origin of Exogamy, appeared in the January number of the "Historical Review." It is supplemented by a short memoir written by his brother.

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THE LATE MR. McLENNAN

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